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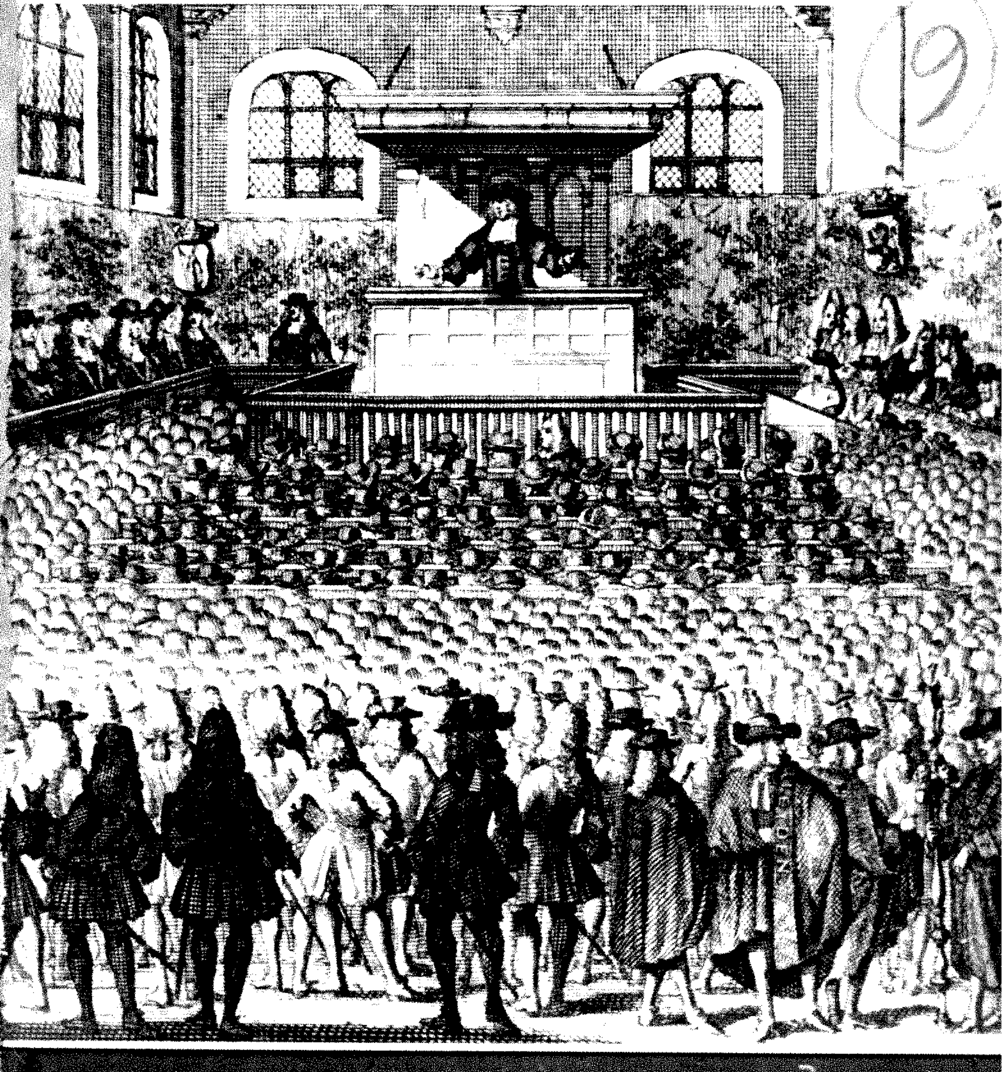

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THE FIELDING H. GARRISON LECTURE*

FROM THE OLD MORTALITY PATTERN TO THE NEW: IMPLICATIONS OF A RADICAL CHANGE FROM THE SIXTEENTH TO THE TWENTIETH CENTURY

Arthur E. Imhof

Since 1975, the German Research Council and the Volkswagen Foundation have funded a research project on the decline in mortality in Central Europe from the sixteenth to the twentieth century at the Free University of Berlin. For this Garrison Lecture, I am going to reflect with some coherence on the goals and intentions of this research project by drawing upon illustrative examples and discussing some broad implications of historical demography for the social history of medicine and the history of *mentalités*.

I will start my discussion by going directly *in medias res* Figure 1 shows some of the results of this research. The different graphs which it contains will serve in the discussion that follows as the basis for an entire series of general considerations. At the bottom of the figure, the mortality in Berlin is presented for every year between 1721 and 1980. In the middle, likewise for Berlin, we find the distribution of deaths according to age group and sex at five different time periods: 1715–19, 1790–94, 1875, 1925, and 1975. Finally, all the way at the top, we see the life expectancy at birth in years for different periods between 1720 and 1980 in Germany

While conducting my research, I first asked myself, of course, what might have been the causes of the mortality peaks in the bottom graph. I then discovered, for example, that the high mortality in the 1740s and 1770s was closely connected with the bad harvests all over Europe. During the Seven Years' War (1756–63), Berlin was occupied by the Austrians in 1757 and in 1760 by the Russians. From 1806 to 1808, the city had to survive under French occupation. Eighteen sixty-six represents the climax of the waves of cholera that had occurred regularly since the 1830s, and the years 1917–18 and 1945 are those relating to the First and Second World Wars

Still, these details are not exactly what we are concerned with here. It is important to consider not this or that special event but rather develop-

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* Presented at the fifty-seventh annual meeting of the American Association for the History of Medicine, San Francisco, California, 3 May 1984

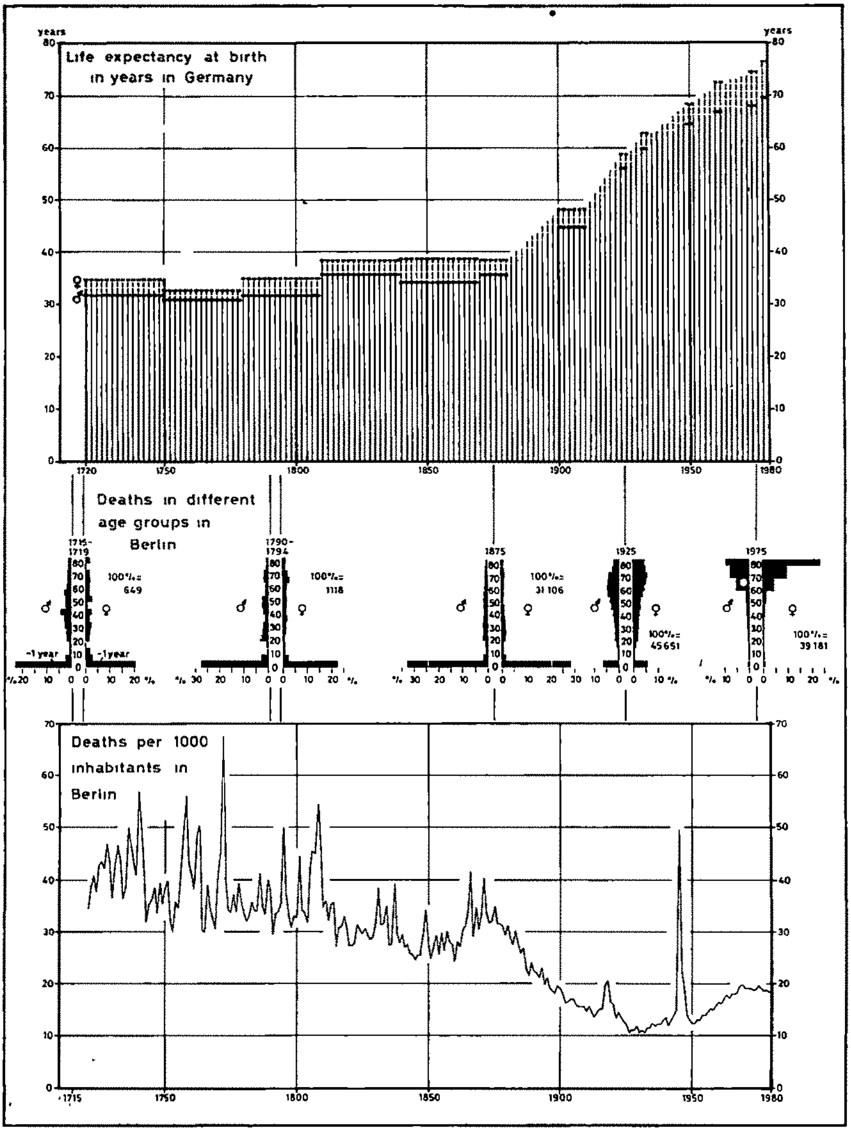

Figure 1 Transition from the old mortality pattern, until around 1875, to the new one *Top* Life expectancy at birth in years in Germany, 1720–1980 (1720–1869, Schwalm region in Northern Hesse, Western Germany, consisting of about eight parishes, 1871–1934, Imperial Germany; 1949–80, Federal Republic of Germany) *Middle* Deaths in the different five-year age groups in percents in Berlin 1715–1975 (1715–19 and 1790–94 in the Berlin parish of Dorotheenstadt, 1875 in Old Berlin, 1925 in Gross-Berlin, 1975 in West Berlin) *Bottom* Deaths per 1,000 inhabitants in Berlin, 1721–1980 (1721–1899 including stillbirths, 1721–1925 in Old Berlin, 1926–80 in West Berlin) From *Berliner Statistik,* 1977, *31* 138–45 and Arthur E Imhof, *Die gewonnenen Jahre* (Munich Beck, 1981), pp 80–81.

ments in the long run, or in the terms of the social historian, the structural changes over time. If we look again at the lowest graph, we can easily read off four structurally different phases. Until about 1820, we have a very turbulent pattern of a high level of mortality with great fluctuations from year to year. Between about 1820 and 1870, there is less fluctuation in mortality but it still remains at a high level. In the third phase between 1870 and 1930, the level of mortality diminishes rapidly and continuously by almost two-thirds, and, in the last phase beginning in the 1930s, mortality gradually becomes stabilized at a low level which is only interrupted by the Second World War and with a certain upwards tendency due to the increased number of elderly members of the Berlin population.

In the middle and top graphs, we see several causes and consequences of this mortality picture. We can easily ascertain that the high level of mortality continuing into the 1870s was above all the result of an extremely high infant and child mortality. However, anyone in those days who had been able to survive the first five years of life could never be sure whether or not he would be snatched away in his youth or young adulthood by this or that epidemic. Dying and death, in fact, did distribute themselves rather evenly among all age groups.

A radical change first took place in the course of the last hundred years. Nineteen twenty-five marked a turning point. Infant and child mortality diminished drastically, and the survivors began to become older and older. And today, the picture which had been valid for centuries has been turned upside down. This can be seen in the middle graph at the far right. One no longer dies as an infant or as a child or youth, and not often as an adult, but instead the majority of people now die at a fairly similar old age.

The result of this late, standardized age of dying is a doubling of life expectancy at birth, as is captured in the graph at the top. This also took place for the most part in the course of the last hundred years. If, formerly, the life expectancy at birth amounted to about thirty to thirty-five years—for women, it was always a bit more than for men—then today it lies between seventy and eighty years.

An initial, broad conclusion based on Figure 1 would be that we can distinguish between two patterns of death and dying: the old pattern which lasted until around 1875 or so, with a structural, very high rate of infant and child mortality and then a scattered range of deaths over all later groups, with big differences from year to year; and the new pattern, "tamed" and standardized at old age, with relatively small differences in mortality from one year to another. In the past, death not only occurred more frequently, but also it was less calculable.

Having said this, we can take an initial concrete example of the research and draw some general conclusions from it. As everyone knows, the changing face of death, the higher life expectancy, and the lower mortality rates have much to do with the so-called "epidemiologic transition." If one follows the concept of Abdel R. Omran, "the [first] age of pestilence and famine, when mortality was high and fluctuating," has been superseded by "the [second] age of receding pandemics, when mortality declined progressively and epidemic peaks became less frequent and disappeared," and this, in turn, has been followed by "the [third] age of degenerative and man-made diseases when mortality continues to decline and approaches stability at a relatively low level."[1]

We now find ourselves in this third stage, and although we are all without exception becoming older, we have nevertheless not become immortal and will indeed never become so. This inevitably leads to a simple but nonetheless basic question of the value and meaning of this kind of supersession of one cause of death by another. Has this ever been, or will it ever be, a really good exchange?

As a historical example of this, Figure 2 shows us how, at the beginning of the nineteenth century after the introduction of vaccination the cases of death due to smallpox among infants and small children were "taken over" by increased numbers of deaths caused by gastrointestinal illnesses. The question that has to be posed is whether it was an advantage to survive the smallpox only to be killed several weeks or months later by, for instance, a summer diarrhea? We cannot ask the children of that time, nor can we ask their parents what their opinions were about this change. But what we can do, stimulated by this figure, is to ask ourselves if we, in turn, are happy with our own causes of death. We have changed them during the last one hundred years or so from smallpox and cholera, from diarrhea, enteritis and dysentery, from tuberculosis, pneumonia-influenza-bronchitis, from diphtheria and scarlet fever to two major causes: heart disease and cancer. Death caused by an epidemic was most often a quick death. The person had not been sick and suffered for a long time, had not been a burden for years to others and in need of their help. Death caused by today's chronic illnesses in old age is precisely the opposite; it most often means waiting for death for years, it means having to come to terms with incurable health losses and coping with these losses both physically and mentally. Has this been a good exchange? One doubts this.

And what will happen if the millions and billions invested in medical research do bring about success sooner or later and, in two or three generations, we no longer die of heart disease and cancer? Even then, neither our children nor grandchildren nor great-grandchildren will become immortal. What will they die from? The question remains the same for them: will it have been a good exchange?

Among the broad conclusions from this figure, I would like to mention the following two:

1) All attempts and strenuous exertions to eradicate the major killers of

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[1] Abdel R. Omran, *Epidemiologic Transition in the US*, *Population Bulletin*, vol 32, no 2, (Washington, DC Population Reference Bureau, 1977), p 9

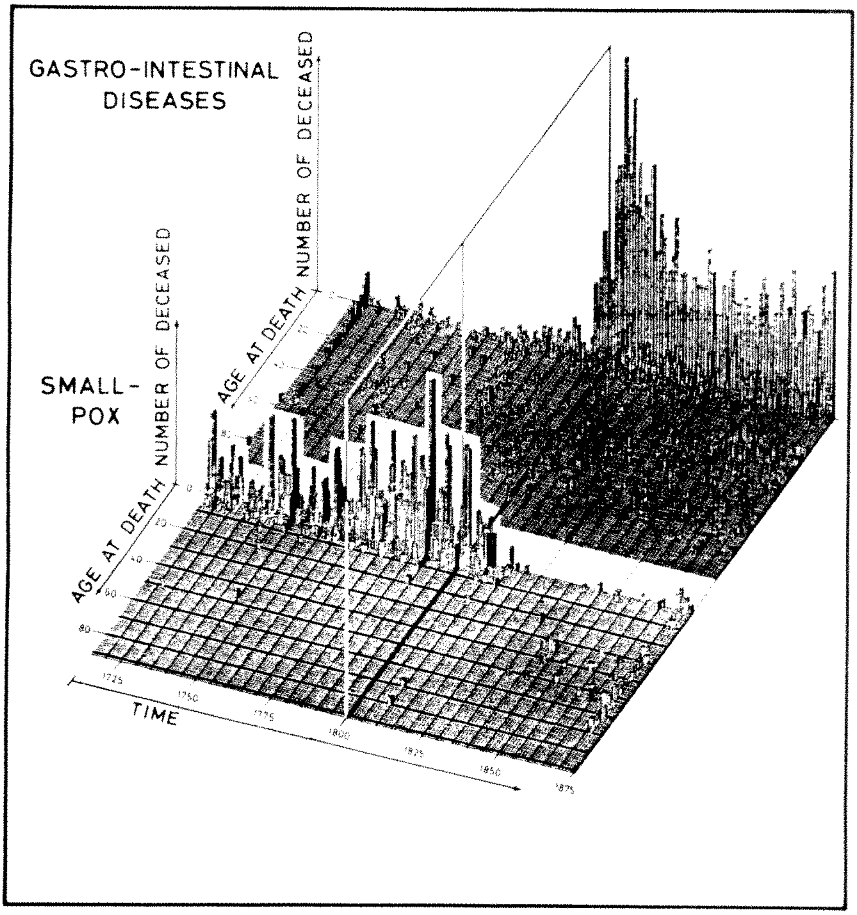

Figure 2. The "over-taking" of a vanishing cause of death by another. The "over-taking" of the smallpox cases of death among infants and small children at the beginning of the nineteenth century (after the introduction of vaccination) by increased deaths due to gastrointestinal illnesses in the Berlin parish of Dorotheenstadt in the period 1715–1875. The collective term "gastrointestinal" encompasses diagnoses—specific to this time period and still very undifferentiated—of constipation, diarrhea, stomach cramps, etc. Of the 2,014 total cases of death subsumed under this term (of a total sample of 2,443), "cramps" befell 1,356 alone (= 55.5%), "diarrhea" 370 (15.1%), and "abdominal inflammation" 288 (11.8%). With that, more than four-fifths (82.4%) of all "gastrointestinal" cases of death are already recorded. *Source:* On-going research in Berlin, on computer data-base.

any given period have to be constantly accompanied by the question of what they will be replaced by. The ideally pictured goal in this context would be to combine the best elements of the old and new mortality patterns and to eliminate the disadvantages of both. This would mean changing the causes of death in such a way that we would still die a sudden "natural" death, but this would occur in old age, and that we would have a long life expectancy but not be infirm at the end, or—in the words of Fries and Crapo—"a rectangular curve."[2]

2) When considering less developed countries, the implications of Figure 2 are even more important, more direct, and concrete. They show that we should not just transfer pure medical knowledge or therapies to these countries by introducing, for instance, smallpox or any other vaccination, without having, at the same time, a look at the other conditions confronting infants which determine life and death. Otherwise, what happened to us at the beginning of the nineteenth century could very easily re-occur: babies might very well survive the smallpox, but in its stead, gastrointestinal illnesses might be just as likely to cause them to die a short time later. And this is because hygienic drinking water and sewage systems had not been provided at the same time.

We should now turn back for a moment to Figure 1 and consider another element for discussion. We have already noted the radical change from the earlier pattern of death and dying being scattered through all stages of life to a more standardized one in our days. This is, however, only one part of the story, only the demographic description of this development. One of the pioneers of an emerging history of *mentalités,* the French scholar Philippe Ariès, stated more than ten years ago in his famous lecture series at the Johns Hopkins University in Baltimore concerning "Western Attitudes toward Death from the Middle Ages to the Present" (1973)[3] that there is a clear coincidence between the new mortality pattern and what he calls the fourth, and until now the last, stage of changing attitudes—the forbidden, the hidden death. Indeed, in 1978, more than three-quarters of all persons who died in Berlin died a more or less "forbidden" death, hidden behind hospital walls, in special "dying-in" rooms, alone, far away from their families, friends, and relatives. This modern combination of dying in old age and out of the sight of others, away from contemporaries, fellow men and women, is clearly and strikingly depicted in Figure 3, in the graph on the right-hand side. On the left, serving as a contrast and as an illustration of the more "open" death of earlier times, there is a picture by the Swiss painter Arnold Böcklin (1827–1901), entitled "The Plague" (1898). The Black Death, portrayed as a blind skeleton, is riding upon a flying dragon through the air. All life wilts before

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[2] James S. Fries and Lawrence M. Crapo, *Vitality and Aging: Implications of the Rectangular Curve* (San Francisco: W. H. Freeman, 1981).

[3] These lectures were published. See Philippe Ariès, *Western Attitudes Toward Death From the Middle Ages to the Present,* trans. Patricia M. Ranum (Baltimore: The Johns Hopkins University Press, 1974).

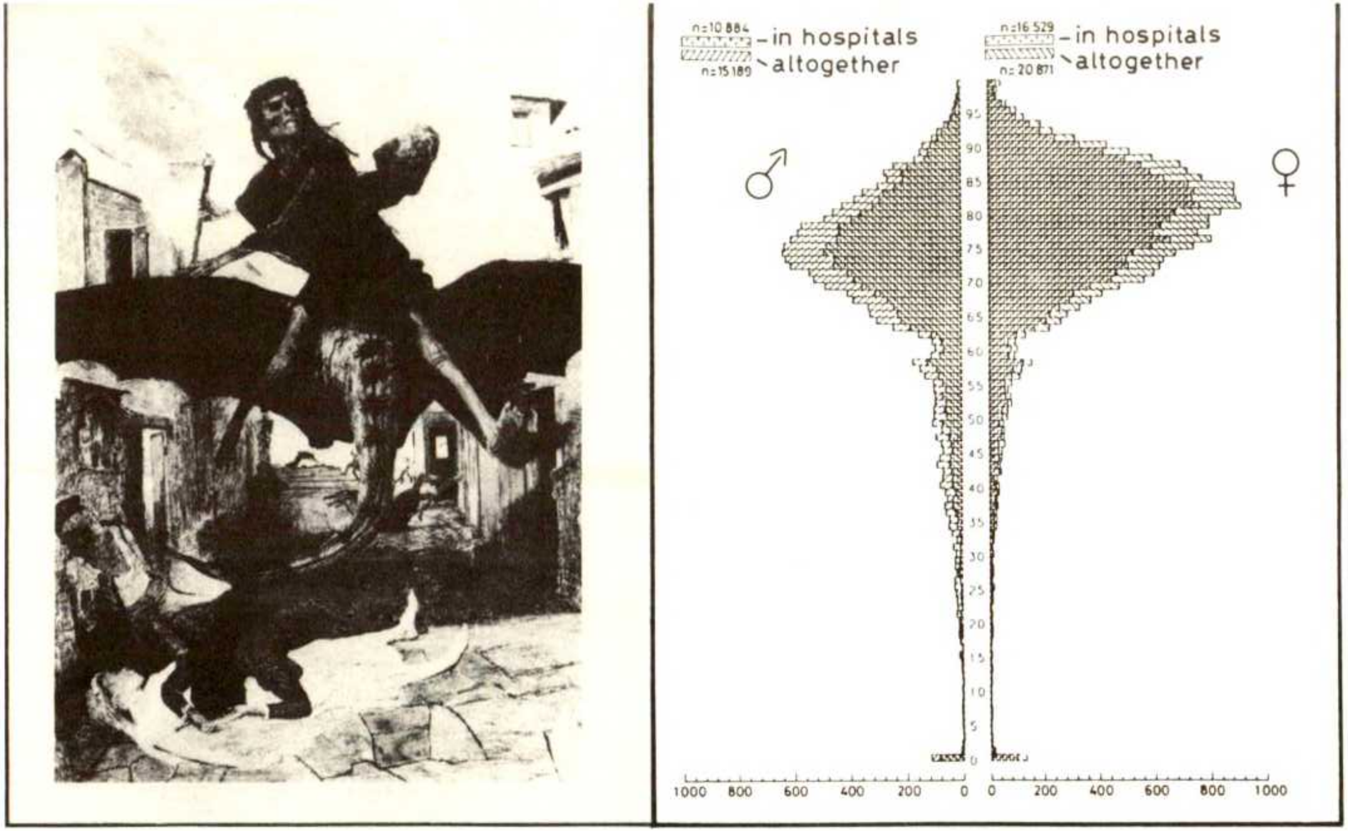

Figure 3. From open death on the street among all age groups to hidden death behind hospital walls and concentrated on a standardized old age. *Left:* Arnold Böcklin (Swiss painter, 1827–1901), "The Plague," 1898. Reproduction by kind permission of the Kunstmuseum, Basel (Depositum der Eidgenössischen Gottfried Keller-Stiftung). *Right:* Age distribution of the deceased in West Berlin in 1978. Total number of deceased: 36,060 (15,189 male; 20,871 female). Total number who died in hospital: 27,413 (76.0%); 10,884 male (71.7%), 16,529 female (79.2%). This information was kindly provided by the Statistisches Landesamt, West Berlin, which arranged a special computation.

the poisonous, hissing breath of the monster, on the open streets, in front of the facades of the buildings: men and women, young and old, children as well as old people.

I have nevertheless chosen this dramatic picture as a way of also demonstrating that I am not one of the nostalgic adherents of an ostensibly "good old way of dying" in past centuries—which stands in contrast to the modern way of dying in clinical solitariness, so often deplored as inhuman, cold, and sterile. When one considers that formerly most deaths were added to the bank account of epidemics, which demanded many dozens of human lives in one small area in the span of a few weeks, often wiping out entire families in a few days, then one can hardly believe the idea imposed retrospectively that in earlier times every dying person was able to depart from this world slowly and peacefully, well-prepared and calmly, surrounded by family members and friends. More often than not, there was very little time for this departure, and the fear which family members and friends had of contracting the disease themselves could not have exactly encouraged intimacy towards the dying person.

At this point, I would like to call attention to an important development relating to the radical change in the social face of death and its implication for the whole of society. Many of the earlier epidemics and pandemics were truly threatening events socially; today's dying in old age, on the contrary, is not. Formerly, plague, cholera, or pneumonia could have stricken persons of all age groups, of all social classes, in the city as well as the country in just the same manner, and could have suddenly attacked a large portion of the population at the same time, just as we have seen in the picture from Böcklin of the *blind,* raging Death. Since *all* persons were threatened in a similar manner, they *all* had also the same interest in taking measures against this. Those who were vested with the authority for decision-making, for example, the government servants or the city councilors, were just as much concerned about this issue as every ordinary city inhabitant or every farmer in the country. We can see, therefore, why in earlier times city councils, whose tone was often set by the merchants, closed the city gates and imposed stringent quarantine measures upon their own communities whenever a contagious epidemic neared, even though their shops suffered noticeable losses because of this. The merchants' interest in surviving was stronger than their immediate financial interests. It is possible that our forefathers achieved some success with this conception of quarantine. Perhaps because of this, the plague disappeared from the European continent after its last epidemic flare-up in Marseille and the surrounding area in 1720–22; this disappearance occurred long before any kind of effective medical therapies had been developed to deal with this disease.

The large number of people dying at the age of seventy or eighty is, in contrast to this, neither contagious for youth, nor does it in any way threaten the entire society. Rather, this dying is concentrated solely in a very specific section of the population. Unfortunately, it is precisely in that section which—leaving children and youth out of consideration—has the least amount of influence. As children and youth signify the future of a society, much is invested in them, and illnesses, dying, and death are to be kept away from them. However, it is obvious that in the eyes of those vested with authority, it does not pay to make investments of comparable dimensions in retired old people. Would it not be a natural conclusion from the graph in Figure 3, for instance, that most medical doctors should specialize in geriatrics? In any case, according to the graph, the most work to be done in medicine would be in this special area. Everyone knows that this is not the case, as a check of the physicians' section of the telephone book reveals, for geriatricians are very few in number. Most of the doctors apparently have not yet discovered old age. And on this point, it should be noted, they do not differ from the rest of us. A hundred years of the new mortality pattern have not been sufficient for us to realize that we are all becoming older and older.

We can, in addition, draw a parallel here to the group of infants and small children. As we have already seen in Figure 1, during the period of the old mortality pattern, for many generations most deaths undoubtedly occurred in this youngest age group. Nevertheless, many years passed before people—parents as well as doctors—actually woke up to this fact and, in the eighteenth century, gradually discovered childhood. As long as infants and small children were present in "overflowing" numbers, few decisive measures were taken to reduce the excessive mortality in this age group. This resembles the approach today in dealing with the excessive mortality of old people who are now present in "overflowing" numbers.

It is therefore easy for the social historian and the historian-demographer to show that society is not so much interested in absolute rates of mortality and lethality—that is, in the life span and death of a special age group per se—but instead is more interested in the standing and significance of this group for and within the whole society. When we have all "discovered" old age and hold this phase of life in higher esteem than we presently do, will we use our influence to a greater extent for the benefit of the elderly? Or will we put it the other way around and say: obviously, many of us today are not very interested in becoming older and older, certainly not under present conditions? For most people, it is less a matter of adding more and more years to a life already long than it is a matter of filling the long years with more life.

With the next figures, I would like to raise and discuss another theme: the implications of the transition from the old mortality pattern to the new one in the sphere of affection between human beings. Just as was the case for Figure 3, these figures offer a combination of graphs and paintings. For when one wants to consider psychological aspects of human life, one often finds that pure statistics and computer data give a very one-sided picture or do not present "the whole truth." The iconographic method too is just as narrow-minded as any other method, if it is only•taken by itself. Often pictures seek to convey a specific message and artists have always allowed themselves a certain liberty of expression. This is why the historian ought not to interpret these pictures in too direct or too naive a manner. What I try to do with this combination is rather to approach "the truth" from two sides: on the one hand, on the basis of hard facts, statistics, computer printouts, and abstract graphs; on the other hand, on the basis of iconographic material. I hope that we will find some bits of truth in between. At the least, our historical imaginations will in this way be more provoked, more deeply engaged, and the reader perhaps will be more stimulated by certain themes than would be the case if we had only dates and graphs at hand.

Figure 4 deals with developments in the age of marriage from the end of the seventeenth to the end of the nineteenth century. To determine these, I investigated the parish registers of the peasant village of Heuchelheim near Giessen in Upper Hesse, West Germany. In the 210 years between 1691 and 1900, I found 1,104 marriages altogether in which both brides and bridegrooms married for the first time. The average age for brides was 24.1 years during the first decade and 24.3 during the last; for their grooms, 25.8 and 25.4, respectively. This surprising result led me to question whether nothing had really changed in the course of this long period of time. I found that certainly there were changes and they were even considerable. It was only that the question had been posed in the wrong manner. Instead of asking about the average age at the time of the first marriage, which certainly did remain stable, one should inquire about deviations from the statistical average.

In order to illustrate this important point, I have recorded the marriage age of each of the 1,104 brides, year by year, in the graph on the outer left. One immediately observes that the points at the beginning lie very far from each other. One bride was seventeen or eighteen, another, twenty-five or twenty-six, and a third was in her thirties. As time passed, the marriage ages became more bunched together, and in the later decades, they have become closely focused around the middle value. As far as the grooms are concerned, a very similar development can be seen: at first there is a very wide scattered range of ages, and then at the end of the time period investigated, there is a focus-like compression. Both developments are schematically represented in combination in the graph at the outer right.

The causes of these developments are easy to understand. In the traditional peasant society, young couples normally married when they could take over a farmstead from the previous generation. During the time of the old mortality pattern, the owner-fathers died at very different ages, one perhaps at thirty-five, another at fifty, a third at seventy or even at an older age. Corresponding to this, the generation that followed was not of a standard age; those who became proprietors and who were then in a position to get

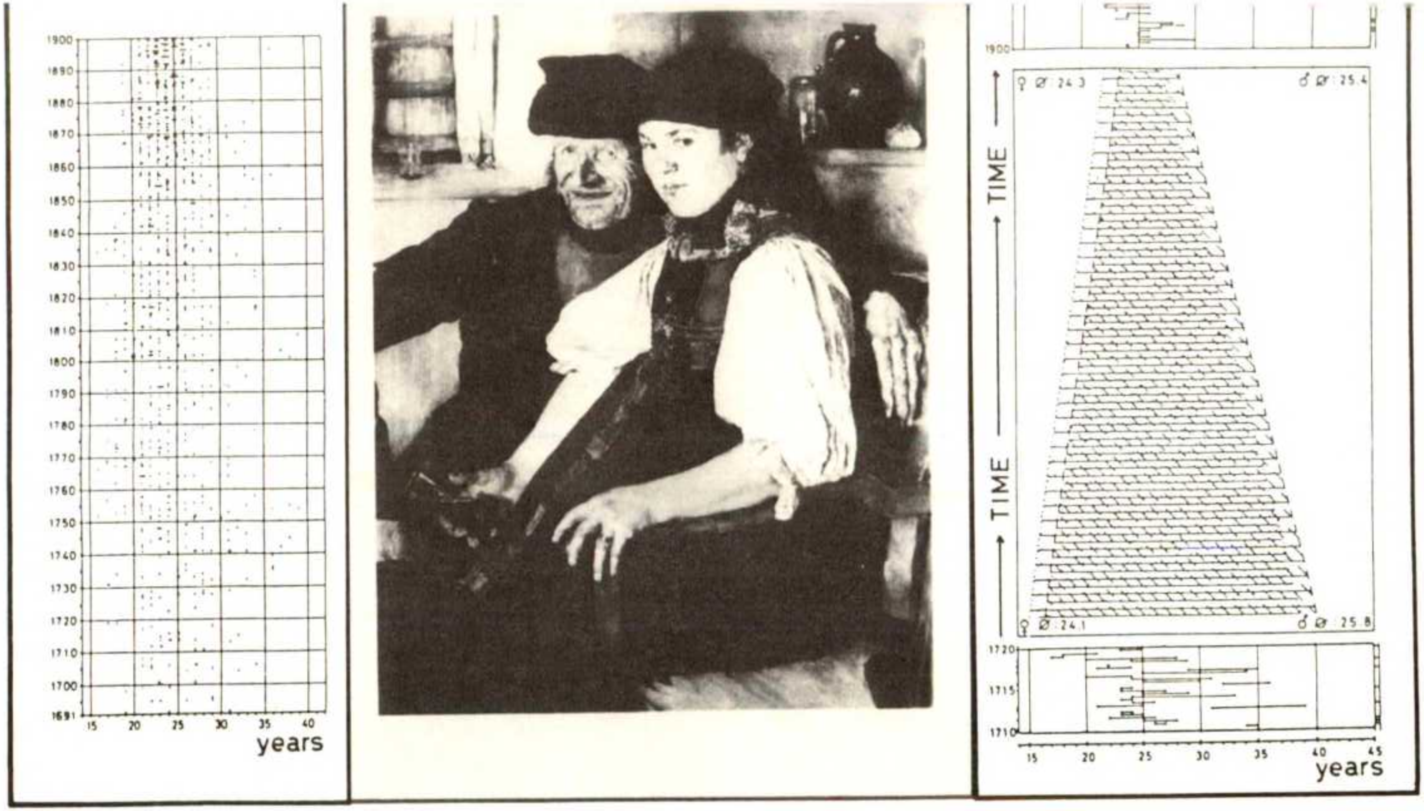

Figure 4. Age at first marriage from the end of the seventeenth century to the end of the nineteenth century. From a widely scattered range to a focusing around the statistical mean age, along with the standardization at a high level of the age at death, occurring in the previous generation, or the latter's retirement at a standardized age. *Left:* Each point designates the age of one of 1,104 women who married for the first time in the period 1691–1900. *Right:* Below and above the pyramid are the age differences between partners marrying for the first time in the decade 1710–20 (bottom) as well as in the year 1900 (top). Marriages in which the woman was older than the man are recorded with strokes and pointed out at the margin on the far right with a stroke. The pyramid schematically reproduces the drastic way in which the marriage age bundled up in the direction of the average age in the course of these two centuries. From Arthur E. Imhof, ed., *Historische Demographie als Sozialgeschichte: Giessen und Umgebung vom 17. zum 19. Jahrhunderts*, 2 vols. (Darmstadt and Marburg: Histor. Komm. für Hessen, 1975), 1: 315–23. *Center:* Wilhelm Leibl (German painter, 1844–1900), "Elderly Farmer and Young Girl: The Unequal Couple," 1876–77. Reproduction by kind permission of Städelsches Kunstinstitut Frankfurt am Main.

married were of very different ages. The standardization of death and dying in the time of the new mortality pattern, therefore, led to a standardization of the marriage age in the generation that followed as well. The level of the new age of death, however, became finally so high that the owners of farms as a rule could or would not run the property until their deaths. They resigned at a given age, at about sixty. The gradual establishing of a standardized retirement age gave way, in turn, to increasing standardization of the age at which the next generation took over the farms; and this also meant a standardizing of the age at the time of the first marriage.

In considering the period of the old mortality pattern, it would likewise be inappropriate to start out from the average ages of men and women at the time of their first marriages and to conclude that the bridegrooms were "normally" or "as a rule" about one or two years older than their brides. Above and below the pyramid at the right in Figure 4, I have recorded the exact age differences between the partners in every single marriage at the beginning and end of the entire time period investigated. Here, too, we can immediately see that at the beginning the age differences were very irregular and often very great, which corresponds with the large scattered ranges of ages of the married men as well as women. In contrast to this, we see at the end that the bride and groom were pretty much of the same age, as is the usual case today.

The picture in the middle of Figure 4, "Elderly Farmer and Young Girl," painted in 1876–77 by the German painter Wilhelm Leibl (1844–1900) in the Bavarian peasant village of Unterschondorf am Ammersee near Munich, shows a situation which was still entirely normal one hundred years ago. At that time, there was no reason for laughing at or ridiculing "The Unequal Couple"—the subtitle of the painting. We do this today because we have totally lost sight of the formerly obvious consequences of the old mortality pattern. A hundred years ago, there were still a great number of "unequal couples" although many did not have the extreme age difference which is presented in this picture.

Reflecting upon the implications of the development as depicted in Figure 4, I would like to mention two crucial points:

1) In earlier times, when there were big age differences between the spouses, the *bodily* attraction between them was not very suitable as a solid foundation upon which to build a long-lasting "happy" marriage. Today, on the contrary, when both bride and groom are about the same *young* age at the time of marriage, sex appeal is often one of the most important motives in deciding to marry this or that person. In our day, a long, sound, happy sexual life may thus well be the core of a solidly knitted marriage for many, many years. Or, if we put it in the words of the historian of *mentalités*: the attitudes of men and women towards sexuality, towards their own bodies as well as towards the bodies of their partners must have radically changed along with the transformation from the old to the new mortality pattern. The

standardization of the marriage age from a broad scattered range to a small focused one around the statistical average provided at the same time the basis for what has been called the "revolution of affection and intimacy" within marriage during the last century or so Furthermore, it is one of the causes for the transition from the old, more open family life of yesterday to the modern, intimate, closed, nuclear, Western family of today Thus, to ask for "love marriages" in former times would again be a "wrong question." This was merely the privilege of some Romeo-and-Juliet figures in romantic love stories, and that, moreover, in our nostalgically transforming retrospective glance.

In analyzing social networks of traditional peasant societies, therefore, we will no longer be surprised to find that, even after marriage, men and women were still primarily members of two distinct "societies"—the male and the female—and stayed in close contact with their old friends and neighbors who were of the same sex and about the same age and with whom they had been brought up. The solidly established connecting lines between them were stronger and more reliable for coping with everyday problems of life than were the new and rather fragile ones between spouses.[4] Today, it is the other way around. When in our day it turns out after several years of marriage that the partners really are not a good match, this is a catastrophe which leads either to one of the frequent divorces or to almost unbearable mental strain and tensions between them. In earlier days, this was not the case. This focusing of affection and intimacy solely upon the person who is one's marriage partner seems to me to be an all-important consequence of the change from the old to the new mortality pattern.

I would like to simply mention at this point that the standardization of age in the course of the time period researched did not, of course, only occur with respect to age at marriage. Over time, this standardizing has appeared in every aspect of life, a consequence of the fact that today almost all of us are becoming equally *old.* Our ancestors' courses of life were much more varied. Today, the life courses of those born in the same year are practically identical and much more monotonous We all enter kindergarten at the same age; go through the mandatory schooling within the same number of years; begin an apprenticeship or university study at the same age; begin practicing our trade or profession in full at about the same time; get married around the same time to a partner who is practically the same age as ourselves, with whom we have about as many, or better yet, as few children; enter post-parental partnership at about the same time, are shipped into retirement at the same age, and finally, depart from the world at practically the same age. The courses of our lives are exchangeable for the most part and have become easier to program. They have become more predictable and more calculable.

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[4] This is one of the main topics in Martine Segalen, *Mari et femme dans la société paysanne* (Paris Flammarion, 1980)

2) The large age differences between partners, as well as the very different ages at death, during the time of the old mortality pattern, had as a consequence that marriages often did not last very long. In our day, there are already numerous divorced men and women in the early years of adulthood, in earlier times, there were numerous widowers and widows in that same age group. In contrast to now, these men and women often had to take care of a whole series of mostly small children even after just a few years of marriage. Consequently, they looked for a new partner and remarried: why not marry a person in the same odd position, that is, a widow or a widower? As a result, rather complicated and intricate family groups can often be found in the earlier time period: brothers and sisters, half-brothers and half-sisters, but also children who were not related to one another at all, all in one family, on one farm, under the same roof

Analyzing for a second time the social networks of traditional peasant societies, one frequently detects—as a psychological consequence of this state of affairs—great tensions within these "family" groups. The children from a first marriage stuck together and kept to themselves, likewise those from a second marriage. But in those two "camps," there were conflicts between the children of the first marriage and their new stepmother who, for her part, favored her own children of the new marriage. These tensions often had very sound causes, since it was frequently a question of which children from which marriage would finally inherit what.

I have tried to represent this entire problematic in Figure 5, with the help of graphs on the one hand, and a painting on the other. The graphs at the top and bottom deal with marriages and remarriages in two peasant villages: Gabelbach in Swabia, southern Germany, and Hesel in East Frisia, northwestern Germany. In both cases, the period under consideration involves the years between 1780 and 1899. Without going into all of the details, which are described in the figure's legend for the interested reader, for our purposes I would like to point to the following facts: remarrying widowers in Gabelbach brought 1.8 surviving children from the first marriage with them into the second marriage. They then had 3.9 more children. Remarrying widows brought 2.2 children from the first marriage and then had 1.2 more children in the second marriage. In Hesel, the figures run as follows: for remarrying widowers, 2.0 and 3.5 children; for remarrying widows, 1.9 and 2.4 children. In my opinion, this already illustrates to a significant extent the demographic causes for the inherent psychological tensions always present in these "families"

We have a superb demonstration of the whole problem in the picture in the middle of the figure. The title is "The Saltonstall Family." The picture hangs in the Tate Gallery in London and was painted around 1636–37 by the English artist David Des Granges (1611–75). Sir Richard Saltonstall of Chipping Warden is standing at the death bed of his first wife, who died in 1630. He is holding his two children from this marriage with his right hand.

With his left hand, he slightly raises the curtain in front of his departing wife who, for her part, is motioning to their two children. On the right side of the picture, Sir Richard's second wife, whom he married in 1633, is seated, and she is holding in her arms the child she has had by him. The single reference point for all parties concerned is Sir Richard. The painting captures his entire dilemma with great psychological understanding. All of these people live next to each other. Indeed, the two children from the first marriage find support in their father who holds them by the hand, but he is simultaneously looking towards his second wife and the child of this new marriage, giving a genuinely helpless impression about the whole situation. The only person whose face expresses resoluteness—leaving the children from the first marriage out of consideration—is the second wife, that is, these children's stepmother; she holds "her" child alone and, notably, with a firm hand, not slackly, like the father holds his own two. The conflicts are pre-programmed: between the children of the first marriage and their stepmother as well as her child(ren), and with a father in the middle who loses out on all sides and lets developments take their evil course.

Moreover, this seems to be precisely the situation that we can find in another kind of source, namely, in numerous German fairy-tales. I am thinking primarily of those from the famous collection by the brothers Jacob and Wilhelm Grimm (1785–1863; 1786–1859), which had been written down at the beginning of the nineteenth century. The fairy tale "Little Brother and Little Sister," for instance, begins in the following manner: "Little brother took his little sister by the hand and said: 'Since our mother died, we haven't had a happy hour Our stepmother beats us every day, and when we go to see her, she kicks us and drives us away. We get hard breadcrusts to eat, and the dog under the table is better off, for now and then she throws him something good. The pity of it! Oh, if our poor mother knew! Come, let's go out into the wide world together.' "[5]

Up to this point, I have treated some broad implications of the old mortality pattern and of the change into the new one, having in the section above concentrated on psychological aspects, including negative ones. I would like to discuss this subject further, now putting forward more positive aspects. One of the most exciting findings during the entire research work, I must confess, has been to see how our ancestors, in a world of great uncertainty about life and death, tried—and *succeeded!*—to counterbalance the instability of everyday life, which was the most prominent implication of the old mortality pattern. They ultimately reached stabilities that not only astonish us but are also rather difficult to understand at times, this is because one of the pre-conditions for this success was a totally different view of and attitude towards their own personalities. They realized—and acted in accor-

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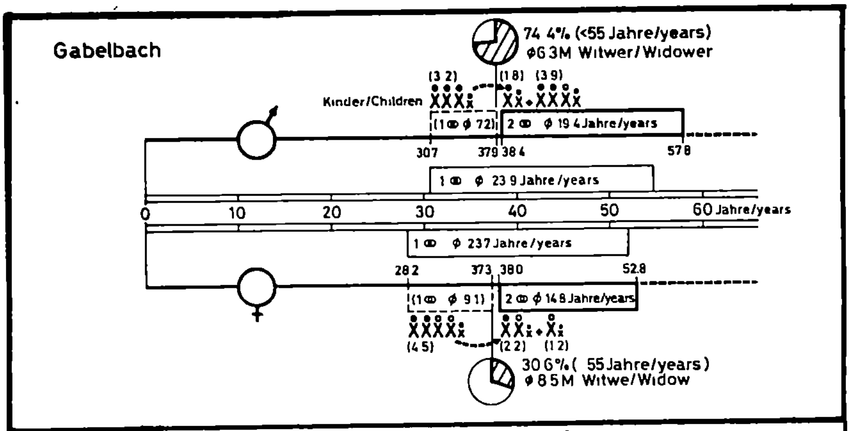
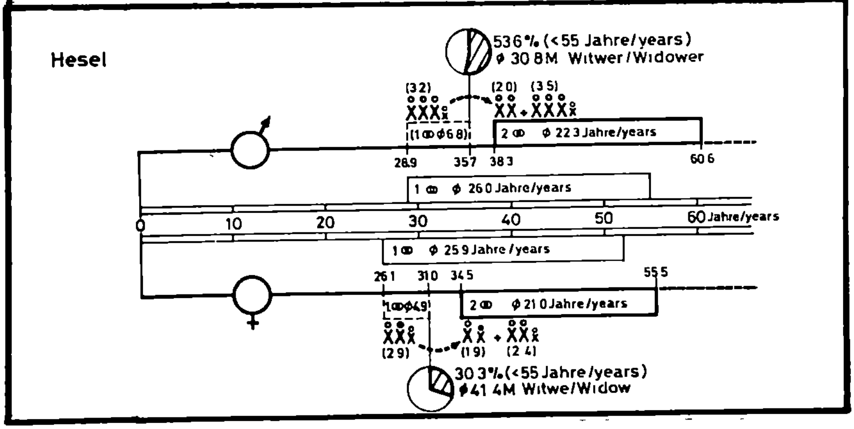
[5] *Grimms' Tales for Young and Old The Complete Stories*, trans Ralph Manheim (Garden City, New York Doubleday, 1977) Translated from the Winkler-Verlag (Munich) edition of the complete *Kinder- und Hausmarchen* by Jacob and Wilhelm Grimm as first published in 1819


Gabelbach
74 4% (<55 Jahre/years)
ø 6 3M Witwer/Widower
(3 2)
(1 8)
(3 9)
Kinder/Children
(1 ⚭ ø 7 2)
2 ⚭ ø 19 4 Jahre/years
30 7
37 9
38 4
57 8
1 ⚭ ø 23 9 Jahre/years
0
10
20
30
40
50
60 Jahre/years
1 ⚭ ø 23 7 Jahre/years
28 2
37 3
38 0
52 8
(1 ⚭ ø 9 1)
2 ⚭ ø 14 8 Jahre/years
(4 5)
(2 2)
(1 2)
30 6% (55 Jahre/years)
ø 8 5M Witwe/Widow

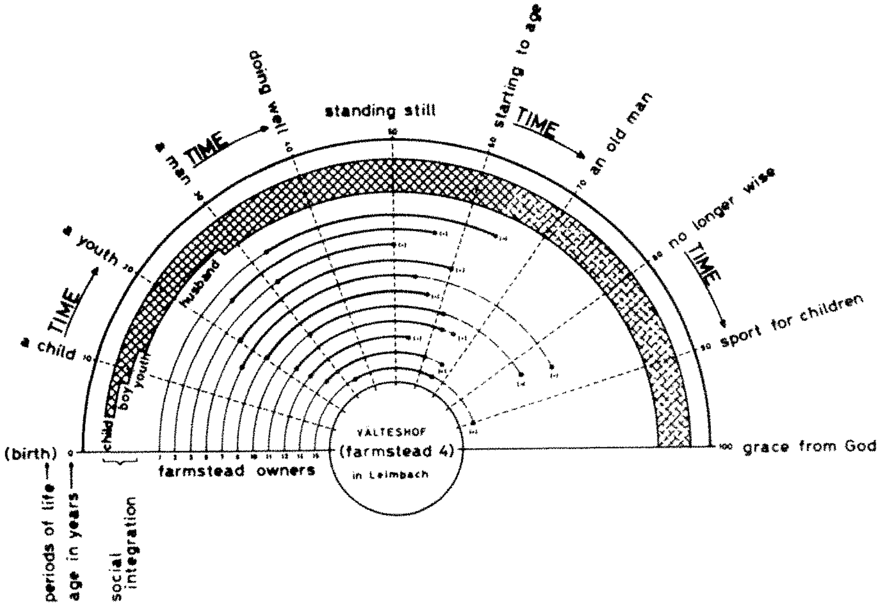

Hesel
53 6% (<55 Jahre/years)
ø 30 8M Witwer/Widower
(3 2)
(2 0)
(3 5)
(1 ⚭ ø 6 8)
2 ⚭ ø 22 3 Jahre/years
28 9
35 7
38 3
60 6
1 ⚭ ø 26 0 Jahre/years
0
10
20
30
40
50
60 Jahre/years
1 ⚭ ø 25 9 Jahre/years
26 1
31 0
34 5
55 5
1 ⚭ ø 4 9
2 ⚭ ø 21 0 Jahre/years
(2 9)
(1 9)
(2 4)
30 3% (<55 Jahre/years)
ø 41 4M Witwe/Widow

dance with this understanding—that it was not very wise, under the conditions of the old mortality pattern, to put one single person, not even their own Ego, in the center of anything whatsoever on earth. This would have been too uncertain. Instead, they developed a kind of thinking in roles. These roles, filled and played by one person-actor after another, could last for centuries; single persons, independent individuals, could not last as long as these roles and cannot do so even in our day. Let us take a concrete example of this and be amazed.

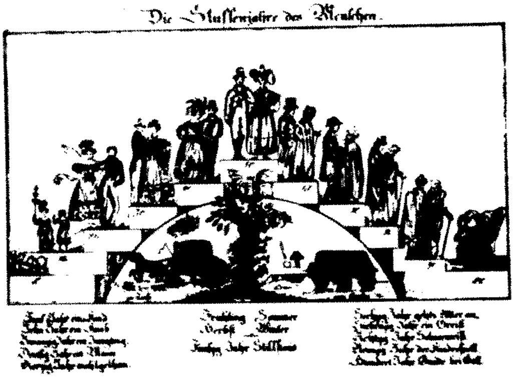
Figure 6—again a combination of graphs, statistics, and a picture—shows us at the very top a section of the wheel of time which turns incessantly. In the center of the circle, I have placed a farm called Välteshof, found in the peasant village of Leimbach in Hesse, western Germany; the time period analyzed is the last four-and-a-half centuries. During this whole long period, from 1520 to 1970, this farm remained stable, in the possession of the same family, named Hooss. How could this have been, above all when one considers that Leimbach is situated in a region where the three scourges, plague, famine, and war, had raged again and again in all their fury throughout the centuries? Various elements come together here, but all of them are witness to the fact that, at Välteshof, the collective interest in the continued existence of this farm was at all times greater than every individual, egotistic, special interest. All of the parties concerned, generation after generation, subordinated themselves to this main idea and agreed to play their roles within it.

An important element in attaining stability was without a doubt the fact that the farmstead was never at any time parceled out, but rather was always given over to the next generation intact. This was even the case when there were several children with inheritance rights; and it was also the case even though the farmstead, covering 43 hectares (= 106.21 acres; 1 hectare =

Figure 5 (facing page). Marriage and remarriage in former times: complicated family formations with inherent psychological tensions. Graphs above and below: Marriage and remarriage in the peasant villages of Gabelbach (Swabia, Bavaria) and Hesel (East Frisia, northwestern Germany), 1780–1899. Taken as the basis are reconstituted families of so-called type I, including marriages of less than five years' duration. Their number amounted to 169 in Gabelbach; of these, 49 with a remarrying partner. In Hesel, there were 519 total marriages, 93 of which were remarriages (29.0% and 17.9% remarriages, respectively). Represented are: age at first and second marriage, length of first and second marriages, length of widowerhood and widowhood in months; percentage of remarrying widowers and widows who had entered widowerhood or widowhood before the age of 55; number of children in the first marriage, number of surviving children brought into the second marriage, and number of children in the second marriage. From J. Dupâquier et al., *Marriage and Remarriage in Populations in the Past* (New York: Academic Press, 1981), pp. 335–46. *Center:* David Des Granges (English painter, 1611–75), "The Saltonstall Family," c. 1636/37. Reproduction by kind permission of the Tate Gallery, London. Sir Richard Saltonstall of Chipping Warden at the deathbed of his first wife (c. 1630), holding the two children from the first marriage with his right hand. On the right, sitting, is his second wife whom he married in 1633 and with whom he had another child; she is holding this child in her arms.



Years of life of the farmstead owner	Farmstead owner from ... up until ... year of life	Death of farmstead owner at the age of
1. Johannes Hooss 1520 - 1584	from 32. to 64. (+)	64 years
2. Johannes Hooss 1560 - 1616	from 24. to 56. (+)	56 years
3. Johannes Hooss 1585 - 1635	from 31. to 50. (+)	50 years
6. Valentin Hooss 1626 - 1686	from 20. to 60. (+)	60 years
7. Johannes Hooss 1670 - 1755	from 16. to 54.	85 years
8. Johannes Hooss 1704 - 1761	from 20. to 57. (+)	57 years
10. Johannes Hooss 1734 - 1817	from 30. to 61.	83 years
11. Johannes Hooss 1773 - 1838	from 22. to 62.	65 years
12. Johannes Hooss 1812 - 1866	from 23. to 54. (+)	54 years
14. Johannes Hooss 1854 - 1920	from 25. to 60.	66 years
15. Johannes Hooss 1880 - 1970	from 34. to 65.	90 years



2.47 acres), was so large that it could have been split up. In spite of this, the principle of impartible inheritance was never questioned by any of the descendants but was unegotistically upheld by everyone. Of course, the children who did not inherit still profited from this system; because of the continued high esteem of the imperturbable Välteshof, it was easier for them to find marriage partners of a similarly high socio-economic position and thus to place themselves on farms elsewhere whose prestige and reputation were not too different from that of Välteshof.

But even the one who did inherit Välteshof had to subordinate himself to the main idea which sustained the system. He only played the role of the proprietor for a certain length of time, just temporarily, and that meant only during his best years. In the middle of Figure 6, the eleven farmstead owners from 1520 to 1970 have each been listed (I have omitted three widows and one trustee). Studying this table, we immediately notice that the life span of each owner is in no way always congruent with the time span during which he ran the farm. Some of them became old, very old: eighty-three, eighty-five, ninety years old. None of them, however, would have even thought of managing Välteshof on through this late stage of life. They turned over the farm to the next generation at the latest in their early or mid-sixties, that is, precisely in accordance with the traditional, popular way of dividing up life in stages:

With ten years a child,
With twenty years a youth,
With thirty years a man,
With forty years doing well,
With fifty years standing still,
With sixty years starting to age,
With seventy years an old man,
With eighty years no longer wise,
With ninety years sport for children,
With a hundred years grace from God.

Figure 6 (facing page). Gaining stability in a time of uncertainty with regard to life and death by playing an important role only during one's best and socially most integrated years. *Top:* The farmstead owners of Välteshof in the peasant village of Leimbach in the Schwalm region, Northern Hesse, 1520–1970. From Gottfried Ruetz, ed., *Hessisches Geschlechterbuch* (Limburg an der Lahn: C. A. Starcke, 1977), vol. 21. *Bottom:* The classification of stages of life in decades has an old tradition. It is exemplified in Middle Europe from the fifteenth to the twentieth century. Prints that portrayed couples climbing upstairs until the fiftieth year of life and from that point going downstairs in the direction of the grave were popular. Seen here is an example from the Swiss Folklore Museum in Basel, "The Step-Years of a Man," about 1830, from Switzerland. Reproduction by kind permission of Schweizerisches Volkskundemuseum Basel. The translation of the inscription below reads as follows:

Five years a child
Ten years a boy
Twenty years a youth
Thirty years a man
Forty years doing well

Spring, Summer
Fall, Winter

Fifty years
standing still

Sixty years starting to age
Seventy years an old man
Eighty years no longer wise
Ninety years sport for children
A hundred years grace from God.

And how could "an old man" of seventy or even a "no longer wise" man of eighty continue managing Välteshof without this being detrimental to the esteem in which the farm was held? The owner need not first become ninety years old in order to be "sport for children," and probably not only for children but sport for many neighbors and villagers as well. The owners understood—and accepted, in accordance with this role-playing which served the requirements of Välteshof—the need for retiring at the state of "starting to age," that is, at sixty or a few years later.

Furthermore, the best years personally of the farmstead owners were simultaneously the years of the greatest social integration as well; this could likewise be used for the benefit of Välteshof, among other ways by increasing its prestige. Each owner had built up for himself in the course of childhood and youth an ever-increasing social network which then experienced its greatest extension at the time of marriage. As he became older, this social network began gradually to crumble away: friends, relatives, and neighbors died. The successors were all rather young people. It became more and more difficult for the aging proprietor to re-establish broken networks. Here again he realized that retirement was—for the farm with its central standing—the better solution and therefore stepped back into the second ranks of the farm activities.

Looking now at the Christian names of the eleven proprietors, one may be at first confused by the repetition of all these "Johanneses." Ten Johanneses and one single Valentin! How was it possible, in a period of high infant and child mortality, that always just the son named Johannes survived and reached adult age to take over the farm? Figure 7 presents the solution to the puzzle. In a given generation, this family actually did not have just one but most often several sons called Johannes. Of a total of thirty-nine male children, not less than twenty-nine were baptized with the name Johannes, be it Johannes, or Johann, or purely Hans, be it in conjunction with a second Christian name such as Nicolaus, Clas, Jacob, Jost, Heinrich, Valentin, Adam, or George. From the dates representing the life spans of these sons, it follows that the baptism of a new Johannes in no way meant that a Johannes born before him had died and made room for a "substitute" Johannes. By means of this two-fold, three-fold, four-fold, or in one extreme case, even nine-fold occupation of the name-place, it was guaranteed that, despite high infant and child mortality, there was always a Johannes left over who could continue the management of the farm under the same name. The one exception in four and a half centuries was Valentin, and this was simply because two of his brothers—both named Johannes!—had died in their early years, and the third brother, again a Johannes, was not yet old enough to inherit at the time that the farm was handed over to the next generation.

When parents today believe that each of their children must have his own first name, this just proves our markedly individualistic way of thinking. And there are probably very few of us who would tolerate having been given the same name as a brother or sister, because we would immediately see this as jeopardizing the unassailability of our individuality. Our ancestors were not only tolerant of this practice of using the same name, but they also repeated it whenever their children were baptized, generation after generation. During the period of the old mortality pattern, it was not the individual who was decisive but the name in itself, which the more or less briefly living individual carried. Just as again and again a different person temporarily became owner of Välteshof, playing the role of the proprietor in his best years, a different person slipped into the name of Johannes, playing the Johannes-role, and that, of course, meant the role of the farmstead owner. In this way, Välteshof was under the ownership of Johannes Hooss not simply for ten, twenty, or even thirty or more years, but rather from the sixteenth century up to the present time. The name stayed the same, only the vehicle or carrier of it changed whenever he gradually became old or died.

Nevertheless, it is probable that this role-playing also met the needs of a given individual in former times, and helped the single individual in coping with *his* life. Today, everyone stands for himself, sets up *his* lifework which he has only the duration of his own life to complete, and must consequently hasten and hurry. Every death is a tragic event today since it puts an end to a life work. This was not the case for the "collective" Johannes Hooss from 1520 to 1970, who was composed of predecessors and successors; and it was also not the case for the respective, individual, name carriers of Johannes Hooss at any time in between. Just as he had predecessors with the same name, he himself lived on in his successors with the same name. There was not a life work that was "his" own, but only a more or less good administration and increase of "their" common life work. With this background, was it not easier to hand over the farm in his late fifties or early sixties, to step back from the main stage, to face death with more equanimity, whether it came today when one was still in one's prime, or tomorrow or the day after tomorrow when one was seventy, eighty, or ninety years old?

"Easier," "with more equanimity": the comparatives form a contrast to our own times in which it is more difficult for us to deal with dying and death. But I would rather not speak of "easy" or "with equanimity" in reference to former times either. There have been very few people at any given time who could have died easily and with equanimity, not even when death was an everyday occurrence, stopping often in every house and making itself known; not even when instructions for a good death had a wider dissemination and a greater number of subscribers, when the belief in an afterlife was more common and the individual perceived himself as the temporary center of the world. Nevertheless, it seems to me that many of these circumstances were more suitable for helping people cope with their everyday problems, which also included stepping down from the world stage, than is the case today.

With my final illustration, I would like to go more deeply into this

P, 25,971

Farmstead owner	Years of life
1. Johannes Hooss	1520–1584
2. Johannes Hooss	1560–1616
3. Johannes Hooss	1585–1635
6. Valentin Hooss	1626–1686
7. Johannes Hooss	1670–1755
8. Johannes Hooss (Son-in-law from Gungelshausen)	1704–1761
10. Johannes Hooss	1734–1817
11. Johannes Hooss	1773–1838
12. Johannes Hooss	1812–1866
14. Johannes Hooss	1854–1920
15. Johannes Hooss	1880–1970
16. Johannes Hooss	1915–

Figure 7. Gaining stability by playing collective roles through the centuries. Eleven individuals named Johannes Hooss playing the "Johannes-Hooss-role"; that is, the role of the farmstead owner on the Välteshof in the peasant village of Leimbach in the Schwalm region, Northern Hesse, 1520–1970. From Gottfried Ruetz, ed., *Hessisches Geschlechterbuch* (Limburg an der Lahn: C. A. Starcke, 1977), vol. 21.

Time period of management	Sons (heir to the farm underlined)	
ca. 1552–1584	1. Curt	1552– ?
	2. Georg	1560–1612
	3. Johannes	1560–1616
1584–1616	1. Johannes d.Ält.	1585–1635
	2. Georg	1589–1635
	3. Jost	1595–1629
	4. Johannes d.Jüng.	1598–1670
1616–1635	1. Johannes	1624–1636
	2. Valentinus	1626–1686
	3. Johannes	1629–1631
	4. Johannes	1631–1669
	5. Clas	1632–1677
1646–1686	1. Hans Class	1667– ?
	2. Johannes	1670–1755
	3. Johann Jacob	1673–1673
	4. Johann Jost	1674–1674
	5. Johann Henrich	1675–1675
	6. Johann Valentin	1679–1761
	7. Johann Henrich	1680–1694
	8. Johannes	1681–1743
	9. Johann Adam	1683–1688
1686–1724	1. Johannes	1711–1719
	2. Johann Valentin	1714–1721
	3. Johann Henrich	1717–1718
	4. Johannes	1719–1719
	5. Johannes	1726–1726
1724–1761	1. Johannes	1728–1728
	2. Johannes	1734–1817
	3. Johann Jost	1744–1792
	4. Conrad	1747–1750
1764–1795	1. Johannes	1773–1838
1795–1835	1. Sebastian	1801–1858
	2. Johann George	1803–1805
	3. Johannes	1812–1866
1835–1866	1. Sebastian	1842–1843
	2. Johannes	1854–1920
1879–1914	1. Johannes	1880–1970
	2. Sebastian	1885–1966
1914–1945	1. Johannes	1915–
1945–		

Figure 7—*continued*

subject—we should first look at the graph at the bottom right in Figure 8. In a way, this is nothing but a schematized resumé of everything that I have described and explained in this paper. At the axis on the left, we see the time running from about the Middle Ages to the present. In this model, we thus find the "earlier" types of courses of life—that is, those in accordance with the old mortality pattern—and "today's" types—those in accordance with the new pattern. In the earlier days, the mean life expectancy at birth may have been, as we know, some thirty or thirty-five years; today, it is between seventy and eighty, some years more for women, some less for men. Centuries ago, we had a broad, scattered range with regard to the individual age at death. In our day, with the standardization of age at every stage of life, we find dying focused around the high statistical mean.

But this summary description presents only one side of the development. What is even more dramatic—and even more important in my opinion—is the other side of the coin. We are sometimes so proud of the fact that we have doubled or even tripled our life expectancy at birth in just a few generations. We completely forget, however, shortsighted as we are, that, simultaneously, we have first of all shortened life to a great extent. "Life" to our ancestors, in contrast to now, meant not merely the earthly life span. Life was composed of a more or less important earthly phase *and* a much more important and longer other worldly, eternal phase. In principle, every person who had been baptized and thus already accepted into the community of all Christians had prospects of being resurrected from the dead and of having an eternal life in the eyes of God. Between the two phases of life there was a "passage"—death and burial. This passage was thoroughly comparable to the other passages in the course of life—Baptism, First Communion, Confirmation, and Matrimony.

Naturally, it is a delicate question to ask how many of your ancestors shared this Christian belief in a resurrection and an eternal life to a genuinely unconditional extent. In the graph, I have recorded four out of five life courses as a suggested number; I request, however, that this data not be taken too exactly. The same goes for the part of the graph dealing with present times, where I have recorded a belief in continued life after death in only one out of five life courses. Whatever the specific figures, with this background in mind, we no longer have any good reason for being proud of the apparent extension of our life expectancy, for what is a doubling or a tripling of life expectancy in the face of an eternity completely secularized away? This still remains a nothingness!

Secularizing and shortening the course of life solely to the earthly phase has had in turn broad implications for our attitudes not only towards death and dying but also, and above all, towards our body and our health. I will start with a short description of these attitudes as they were before the radical transition took place. For this purpose, I have set up three illustrative pictures from the sixteenth, seventeenth, and eighteenth centuries. They show in succession baptism, at the top left, as the first important passage in human life; at the top right, a section from the earthly phase of the course of life, and at the bottom left, death and burial as the turning point between the earthly life and the eternal phase of life; this, exactly as they were familiar to and accepted by our ancestors.

Since in accordance with Christian belief only baptized souls had prospects of an eternal life in heaven, baptism was one of the all important, if not the most important, event in the earthly phase of human life. Baptism was *the* key to eternal happiness, the "vaccination," so to speak, for an everlasting life. To die without having been baptized was a catastrophe, according to this view. During this period of an immense infant mortality, however, this is precisely what occurred rather frequently. Either the children came into the world already dead, or many of them died a very short time after birth, without having been baptized. Hence, they were not allowed to be buried in the cemetery in consecrated ground but instead were placed under the ground at some unspecified place like dead animals. But the worst was that they could never behold the countenance of God but had to stray about forever in darkness. This was an unbearable thought for the parents concerned. For this reason, the "common folk" created for themselves the institution of the so-called "children's sign" which, although never acknowledged by the official Church, was more or less tolerated for centuries.

One carried the small corpse into a nearby church of pilgrimage, often a sanctuary of the Blessed Mary, laid it down before the miraculous picture or statue, and remained transfixed in fervent prayer until the corpse gave a brief indication of life—that is, it gave a sign—for instance, by becoming red in the cheeks from the glow of burning candles. At that point, the child could be baptized and, after the immediate return of death, could be buried in the cemetery. The eternal life of the child had been saved. We can see this custom at the above left in a votive picture (ex-voto) which the thankful parents of one such child who had given a sign deposited in 1746 in the Catholic parish church of Schattdorf, Kanton Uri, Switzerland. This custom of the children's sign was very widespread in all of Catholic Europe, especially between the fifteenth and eighteenth centuries. Between 1686 and 1720, for example, no less than 24,000 small corpses were carried to one of the most famous places of pilgrimage for children who gave the sign, the monastery of Ursberg by Augsburg in Bavaria, and there they were baptized.[6]

As long as dying and death only signified a turning point between the less important life here on earth and the eternal life in the other world, it was not as important as it is now exactly when this juncture took place. Neither death itself nor the earthly life had the weight that it does today. With this background in mind, perhaps one no longer wonders so much about seeing bridges in many landscape paintings of the sixteenth, seven-

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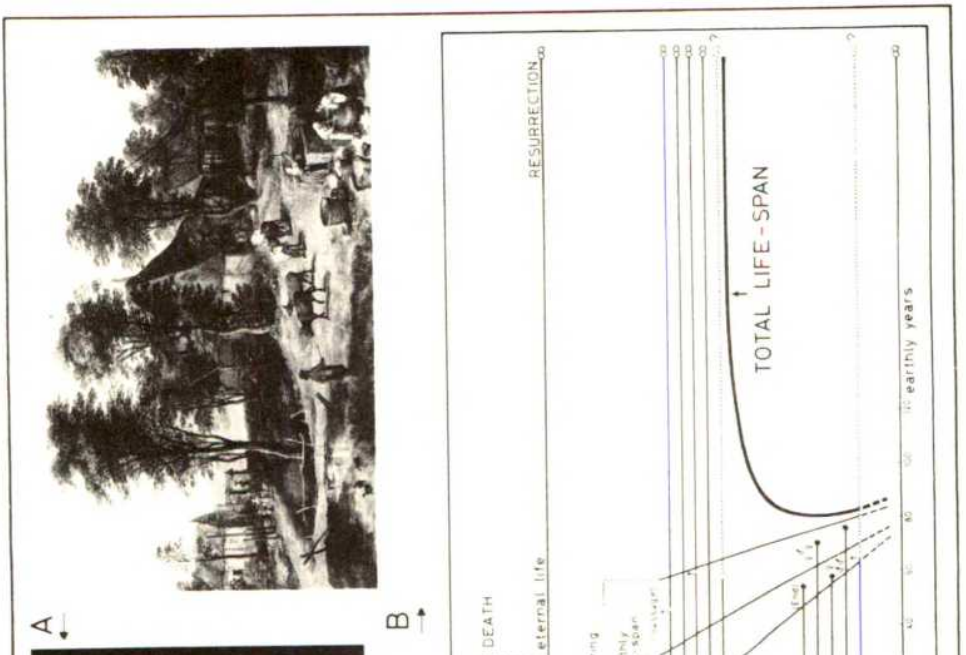
[6] Cf. on this topic: Jacques Gélis, "Miracle et médecine aux siècles classiques: le corps médical et le retour temporaire à la vie des morts-nés," in *Historical Reflections/Réflexions Historiques*, 1982, 9: 85–101.


A
B
C
D
EX VOTO
BIRTH
DEATH
earthly life
eternal life
RESURRECTION
scattering range
ø earthly life-span
TIME
life courses "earlier"
life courses "today"
TOTAL LIFE-SPAN
earthly years

teenth or eighteenth centuries which have either no railings or, as in the picture at the top right, only have railings that have caved in or are so wobbly that we would not risk holding onto them when crossing. In those days, however, these "makeshift bridges" had to be used daily. And even though this often had as a consequence—as we know from the many entries in the death registers—that people died by drowning, the railings were not repaired but were left in their bad condition for years. This seems to me to be a very clear and, at this point, perhaps a more understandable indication of the greater "apathy" in former times towards human life on earth.

Finally, the last illustration at the bottom left shows the cemetery in front of the Eglise des Saints-Innocents in Paris in the sixteenth century. One can immediately see how closely life, dying and death were linked at that time, how they all comprised a completely unquestionable unity It was not simply that the cemetery, bone houses, and the buried themselves were found right in the midst of the living, amidst their living quarters, but at the same time the living actually made the cemetery into a place for socializing. Just as the dog in the foreground went about his business completely undisturbed, the people promenaded in the cemetery, told each other the latest news, did business, bought and sold, begged, and dug out the bones once the body was decomposed so that they could be deposited in the bone houses, thereby making room for the new interments. Can a more drastic illustration be

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Figure 8 (facing page) What really changed. some more years on earth, but a lost eternity *A* "Children's sign" When children were stillborn or died before being baptized, one implored the Mother of God or special saints for so long until the small corpse was awakened to life for a short time and gave a sign One could then baptize the child and bury him in consecrated ground *Baptism* was the key to the kingdom of heaven This practice is represented here on a votive tablet from the parish church of Mariae Himmelfahrt (Mary's Ascension into Heaven) in the Community of Schattdorf, Kanton Uri, Switzerland, from the year 1746 The text states that a child was premature and stillborn The father has the small corpse in his left hand. After the father had implored the Mother of God, the child gave a short sign of life and could then be given the necessary baptism *B* In the landscape pictures of the sixteenth, seventeenth, and eighteenth centuries, bridges were depicted often with no railings or with railings that had caved in or were very wobbly Correspondingly, we find in the burial registers of those times entries of deaths attributable to falling into the water and drowning After one had been baptized and had the key to the kingdom of heaven, one obviously did not have to attend to the earthly life in the manner of today, in which the earthly phase is the only phase and for most people, prospects of an other-worldly, eternal phase are no longer present. Jan Brueghel the Younger (1601–78), "Cour de ferme " Reproduction by kind permission of the Musée du Louvre, Paris Cf in the U S as an example, Jacob van Ruisdael (1627/29-82), "Landscape with Footbridge," The Frick Collection, New York, where there are absolutely no railings *C* Just as death was only a turning-point, a passage between the earthly and the eternal phase of the entire course of life, the living and the dead also belonged together Dying and burial were everyday events as much as shopping, exchanging bits of news, and doing business The cemetery was just as much a market place and center of social living Bone houses with hundreds and thousands of skulls and bleached bones of ancestors formed the familiar backdrop. This is represented by Jakob Grimer (?), (Flemish painter, 1526–89), "Le cimetière et l'église des Saints-Innocents, Paris " Reproduction by kind permission of Musée Carnavalet, Paris *D* Tentative schematic representation of the increase of our life expectancy on earth along with the simultaneous secularizing away of eternal life during the transition from the old mortality pattern to the new one.

thought of for showing that formerly death and dying really only meant a passage?

And today, after the transition? In a time when baptism is no longer a guarantee of eternal life, in which bridges all have stable railings and stringent occupational safety measures of every kind see to it that we no longer injure ourselves physically? In a time when we have not only banished cemeteries and bone houses out of our view but have banished death and dying out of our thinking and out of our social life, constraining them to special homes for the elderly, behind hospital walls? What have we gained by and during this change? Some more years on earth but without any future because we have lost eternity at the same time. The implication of this transition upon our everyday life is not only that fears of death have entered into a concentrated, fatal symbiosis with the later stage of human life, but also that, for each of us, the body has undergone a tremendous appreciation in value. This is because the body's condition is now more than ever the sole guarantee for the phase of life which remains to us—the earthly phase. The healthy, young body, which is as far away as possible from dying and death as well as from simply fading, has been made into a fetish and an idol. If the body fades, then today our entire life automatically loses its zest For this reason, we attend to the body most carefully, applying make-up to it, perfuming it, deodorizing it, dressing it in velvet and satin, nourishing it with food of the highest quality, and swallowing vitamin preparations as well, so that it lacks absolutely nothing. We place the body in completely air-conditioned rooms for work and lay it in soft beds for sleeping, and grant it pauses and vacations. This is simply throwing sand in our eyes. In this manner, we may certainly be able to gloss over the physical signs of aging to the outsider and perhaps even to ourselves; and, in time, we may even be able to slow down, somewhat, the genetically pre-programmed aging process so that our mean life expectancy at birth increases in two or three generations possibly to 100 or 120 years Through all of this, however, we still do not attain immortality; or would it be better if I said, yet again we do not reach it? The other-worldly, eternal life, which had been the most important phase of life to our ancestors, appears to have been completely lost to us.

To sum it up, it is not my opinion that we should try to turn back the wheel of history in order to bring back eternity. Every part of history is unique and incapable of being repeated. Nevertheless, I think—and this would be the very broad conclusion of all my research work up till now—that growing old, dying and death should not be put into a vacuum, as is now all too often the case Even if these can no longer be a passage between the earthly and the other-worldly life, they should at least remain a part, and an integrated and an accepted part, of our earthly life. In this way we could, in my opinion, at least regain a more natural and less cramped relationship with our bodies, even when they do fade and finally fail in their duties. This remark would at the same time be my message as a social historian not only for the social history of health and medicine but also for several branches of modern medicine, such as social medicine, community medicine, and preventive medicine.

And if one allows the historian to pronounce judgment on past times and generations, then it would be my opinion that, in a world full of uncertainties during the period of the old mortality pattern, our ancestors did not come off too badly in their endeavors to sustain themselves and to attain stabilities of long duration despite adverse circumstances. In their own way they were successful because they had an all encompassing and a working *vision du monde,* a world perspective which integrated not only high infant and child mortality or even stillbirth, but sudden death and dying at every stage of later adulthood as well. Along with the transition into the new mortality pattern, we lost this vision and, I am afraid, we have not yet found a new one. Life and death have become completely separated, at the moment, they are two totally different things for us, hard to combine. As long as we are willing to accept only the first one and to reject the other, we will remain in an unsolvable dilemma and continue to find ourselves—every time we are forced to attend a burial—in a situation like a blown-up soap bubble.

TROTULA, WOMEN'S PROBLEMS, AND THE PROFESSIONALIZATION OF MEDICINE IN THE MIDDLE AGES*

John F. Benton

In the course of the twelfth and thirteenth centuries the practice of medicine in the Christian West moved from a skill to a profession, with academic training based on authoritative learned literature, with degrees and licenses, and with sanctions against those who practiced medicine without a license. Traditional folk remedies continued to be used, of course, and the actual delivery of babies was exclusively the domain of midwives and female attendants, but increasingly the health-care of well-to-do women was supervised by academically trained physicians. The universities did not, of course, produce enough graduates to fill the medical marketplace, but medical schools nevertheless provided the standards and the concepts which determined the nature of professional practice. Since they were excluded from university education, women were thereby barred from the formal study of medicine and from professorial positions, as well as from the most lucrative medical practice. There were, naturally enough, regional variations in this development, and these generalizations apply more completely in northern Europe than in the south, particularly southern Italy and Spain.

Once universities had been granted a role in medical licensing, female practitioners could easily be prosecuted as charlatans, and though women provided most of the direct, bedside care of other women, it was to male physicians that wealthy couples turned for consultation on such matters as sterility or care during pregnancy. The theoretical understanding and scientific investigation of women's medicine was therefore a near monopoly of men. Overwhelmingly, the gynecological literature of medieval Europe was written for a male medical audience and was a product of the way men understood women's bodies, functions, illnesses, needs and desires. For

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Bull. Hist. Med., 1985, *59*: 30–53

those women who could afford professional medical care, the most fundamental questions of their health and illness were defined by men.[1]

The process I have just described as occurring in the Middle Ages was repeated in the United States with remarkable consistency in the early twentieth century, as the country altered its rural and frontier medical practices and incorporated its new immigrants. At the beginning of the century the ratio of physicians to total population was three times what it is now, and many physicians were products of unaccredited medical schools Midwives delivered approximately half the babies born in the early years of the century, and women were extensively involved in non-professional health-care for their families and neighbors. Women were excluded from many medical schools and were discriminated against in others, so that in 1900 only 5 percent of the students in regular medical schools were women, though 17 percent of those in homeopathic schools were female.

In the light of these facts, it can be seen that the early twentieth-century campaigns against midwives and for "regular" professional medicine practiced by licensed medical school graduates worked against any significant role for women in medicine except nursing, and even obstetrics and gynecology became overwhelmingly male domains. Today, while the percentage of women students in medical school is now approaching 30 percent, still only 12 percent of board-certified gynecologists and obstetricians are women. In the United States as elsewhere the professionalization of medicine has meant that the scientific investigation and treatment of women's bodies has been largely in the hands of men.[2]

I have cited this modern experience not simply as an example of a "structural regularity in history" but because it is difficult to understand much of the secondary literature on the legendary figure of Trotula without appreciating the social context in which historians have written about women in medicine.

Two questions have long dominated discussions about Trotula: did a medieval female physician named Trota or Trotula really exist, and if so, did she write the widely distributed gynecological treatises attributed to her? In this paper I hope not only to answer, but to go beyond, these long-standing questions. If a re-examination is now appropriate, it is in good part because the intellectual and social climate has been changed by notable women like those with whom I am about to differ.

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[1] For a recent prosopographical study based on references to some 125 women who practiced medicine as midwives, surgeons, *miresses*, etc., see Danielle Jacquart, *Le Milieu Médical en France du XII^e au XV^e siècle* (Geneva Librairie Droz, 1981), pp 47–55 Pearl Kibre, "The Faculty of Medicine at Paris, charlatanism and unlicensed medical practice in the later Middle Ages," *Bull Hist Med*, 1953, *27* 1–20, remains a fundamental source for the study of the exclusion of women from the practice of medicine For the larger setting, see Vern L. Bullough, *The Development of Medicine as a Profession The Contribution of the Medieval University to Modern Medicine* (Basel and New York S Karger, 1966)

[2] For a critical review of recent literature see Martha H Verbrugge, "Women and medicine in nineteenth-century America," *Signs*, 1976, *1* 957–72 For the details in this and the preceding paragraph see also Frances E Kobrin, "The American midwife controversy a crisis of professionalization," *Bull Hist Med*, 1966, *40* 350–63, William G Rothstein, *American Physicians in the Nineteenth Century* (Baltimore and London The Johns Hopkins University Press, 1972), pp 300–301, n 5, and Barbara Ehrenreich and Deirdre English, *Witches, Midwives, and Nurses A History of Women Healers* (Old Westbury, N Y The Feminist Press, 1973) On the development of male midwifery (unknown in the Middle Ages), see John S Haller, Jr , *American Medicine in Transition, 1840–1910* (Urbana University of Illinois Press, 1981), pp 150–91

The modern history of Trotula was shaped by Kate Campbell Hurd-Mead, who took her medical degree at the Women's Medical College of Pennsylvania in 1888. A gynecologist and president of the American Medical Women's Association, she published an article on "Trotula" in *Isis* in 1930 and devoted a major chapter to her in *A History of Women in Medicine from the Earliest Times to the Beginning of the Nineteenth Century*, which she published in 1938. Dr. Mead made a founding heroine of Trotula, whom she called "the most noted woman doctor of the Middle Ages": "To any woman doctor of the twentieth century . . . there would seem to be no good reason for denying that a book having such decidedly feminine touches as Trotula's was written by a woman. It bears the gentle hand of a woman doctor on every page."[3]

Dr. Mead's work inspired Elisabeth Mason-Hohl, a Los Angeles surgeon, who in 1940 delivered her presidential address to the American Medical Women's Association on "Trotula. Eleventh-Century Gynecologist" and in the same year published a translation into English of most of the work attributed to her.[4] With such eminent sponsorship as this, there is little wonder that Trotula is one of the honored guests in Judy Chicago's feminist work of art, *The Dinner Party.*

In the later Middle Ages the most popular treatises on the diseases, medical problems and cosmetics of women were attributed to an author generally known as Trotula. Commonly two treatises were distinguished, known as the Greater Trotula or *Trotula major* and the Lesser Trotula or *Trotula minor,* but the situation is more complex than that, for three different units were presented under these names. One tract, beginning *Cum auctor,* is concerned exclusively with medical matters and is often called *Trotula major.* The authorities cited in this work include Galen, Hippocrates, Oribasius, Dioscorides, Paulus, and "Justinus."[5] A second tract, beginning *Ut de*

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[3] Quotation from Kate Campbell Hurd-Mead, "Trotula," *Isis,* 1930, *14·* 364–65 It is evident that the editor of *Isis,* George Sarton, accepted this seriously flawed article for publication without being convinced by it, for when submitting a revised text, Mead wrote to Sarton on 3 January 1930 "I only hope you will be converted to my theories about Trotula and become one of her champions " See her correspondence in the Sarton collection at Harvard University, 6MS Am 1803 (1022), and George Sarton, *Introduction to the History of Science,* 3 vols in 5 (Washington, D C.· Williams & Wilkins, 1927–48), 2 242–43 The contemporary treatment of Trotula by Dr Melina Lipinska is more cautious and restrained than Mead's, see her *Les Femmes et le progrès des sciences médicales* (Paris Masson, 1930), pp 27–30

[4] The lecture was published as "Trotula eleventh century gynecologist," *Med Woman's J*, 1940, *47* 349–56, the translation as *The Diseases of Women by Trotula of Salerno* (Hollywood, Calif Ward Ritchie Press, 1940)

[5] Most early manuscripts read Justinus, Justinianus, or something of the sort, Paris, Bibliothèque nationale (B N) lat. 7056, ff 77–86v (= Ms *A*) cites Copho at this point (f 78vb), but it is the only early manuscript I know to do so Perhaps the name of Justus, a contemporary of Galen and the author of a *Gynaecia,* appeared originally, in which case all of the authors cited in *Cum auctor* would have been ancient authorities In the second chapter of the introduction, the author says the text is based on material from Hippocrates, Galen and Constantine the African (*A,* f 77rb), other manuscripts frequently replace the name of Constantine with that of Cleopatra. One should not be overly impressed by the author's learning, most of the ancient citations are to be found in the *Viaticum* and *Pantegni* of Constantine the African

curis, is largely concerned with medicine, though it includes a good deal of cosmetic information too It repeats a number of topics treated in *Cum auctor* and cites no ancient authorities, but refers to Copho of Salerno, Magister Ferrarius (the name of a family of physicians at Salerno in the twelfth century), the women of Salerno, and Trota or Trotula herself. Both treatises deal predominantly, but not exclusively, with medical matters concerning women. A third tract, called *De ornatu,* deals almost exclusively with cosmetics, beauty aids, dentifrices, depilatories, body odor and so on, it cites no authorities except unnamed "women of Salerno" or "Saracen women." *Ut de curis* and *De ornatu* are often lumped together in the manuscripts as *Trotula minor.* Other manuscripts present all three tracts together as a single, undifferentiated work, and manuscripts of this type appear as early as the second quarter of the thirteenth century.[6]

The contents of these treatises show that all three were either written at Salerno, the most important center for the introduction of Arabic medicine (and therefore Galenism) into Western Europe, or under the influence of Salernitan masters. A survey of the existing manuscripts suggests two further things about their origins. In the first place, no manuscript of any of these texts has been discovered which can be dated much before 1200, a fact which speaks strongly though not conclusively against composition before the latter part of the twelfth century. Secondly, in some of the earliest manuscripts the three tracts appear separately from each other, and commonly anonymously, indicating that they were not thought to have a common author, or even any identifiable author.

In one of the two earliest manuscripts of any of these texts I have studied, which on paleographic grounds may be attributed to the early thirteenth century (or possibly the very end of the twelfth century), *Cum auctor* appears with *De ornatu* but without *Ut de curis* This manuscript, from southern France, is headed *Liber de sinthomatibus mulierum* and does not mention Trotula in either its text or rubrics[7] Another manuscript of approximately the same date contains *Ut de curis* without the other two texts; this is the earliest manuscript of these texts I have seen which contains the name of Trotula in its rubrics.[8] In a manuscript of the second quarter of the thirteenth century which once belonged to Richard de Fournival, *Ut de curis* is followed directly by *De ornatu,* creating the usual form of *Trotula minor,* but *Cum*

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[6] Cambrai, Bibliothèque municipale ms 916, a northern French collection of medical texts, presents all three tracts as a single unit on ff 228v–242v, with the rubric *Incipiunt Cure Trotule*

[7] Paris, B N n a l 603, ff 55–59v I have not yet seen Erfurt, Wissenschaftliche Bibliothek, Amplonian Q 204, which contains *De ornatu* on ff 78v–79v and *Cum auctor* on ff 95v–97, both in hands described in the catalogue as twelfth century, see Wilhelm Schum, *Beschriebendes Verzeichniss der Amplonian Handschriften-Sammlung zu Erfurt* (Berlin, 1887), pp 461–63

[8] London, British Library (B.L.) Sloane 1124, ff 172–178v, the opening rubric is *Incipiunt capitula Trotule* in the same hand as the rest of the text, though the chapter headings were never added The manuscript is contemporary with B N n a.l 603, cited above

auctor does not appear at all.[9] In some ten manuscripts *De ornatu* appears without the other two treatises. The origins of these three texts are to be found in the separateness of their manuscript histories, not in their eventual unity.

Stylistically *Cum auctor* differs so markedly from *Ut de curis* that I conclude they had different authors. For instance, in *Ut de curis* twenty-five sentences begin with the word *Sunt* (*Sunt quedam mulieres, Sunt quedam, Sunt et alie,* etc.), while in *Cum auctor* no sentence uses this construction. The third treatise, *De ornatu,* begins with a preface, *Ut ait Ypocras,* followed by the main text, *Ut mulier levissima et planissima.* While the first two tracts are written for the use of other physicians, *De ornatu* in its original form addresses a female audience directly; it seems to me clear that it was written by a different author from either of the first two. This author, in fact, refers to himself as a man. The introduction which normally begins *De ornatu* when it appears with other texts is an abbreviated variant of the prologue to the independent treatise which survives in a mid-thirteenth-century manuscript from southern France as well as in later manuscripts. In this prologue the author or compiler refers to himself in the masculine gender, quotes Persius, and says he is publishing his work because women have many times asked him for advice on beauty aids. The rubric of one fifteenth-century manuscript identifies the author as "Ricardus medicus expertus," perhaps meaning Ricardus Anglicus, sometimes known as Richard of Salerno.[10] The edited prologue follows in an appendix

Most manuscripts of the three tracts make no distinction of authorship. In their rubrics the scribes commonly attribute the texts to "Trotula" or "Trota," treat the author as a woman, and sometimes identify her as a "healer from Salerno" (*sanatrix Salernitana*) or something of the sort. Such information shows us what scribes believed to be the case, but rubrics are a notoriously poor source of biographical information. In the sixteenth century the situation became even more muddled, for the editor of the *editio princeps,* Georg Kraut, created a single work from the three medieval treatises at his disposal, rearranging material from *Cum auctor, Ut de curis* and *De*

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[9] New York Academy of Medicine ms SAFE, ff 77–82 This important manuscript, which once belonged to the Drabkins, is described in Caelius Aurelianus, *Gynaecia,* ed Miriam F Drabkin and Israel E Drabkin, Supplement to the *Bulletin of the History of Medicine,* 13 (Baltimore The Johns Hopkins Press, 1951), pp v–vi Though the Drabkins state that the manuscript "seems to be a copy of the very volume that de Fournival had in mind," Professor Rouse is convinced that it is the manuscript owned by Richard de Fournival (who was licensed to practice surgery) and which he may have inherited from his father, physician to Philip Augustus. For the history of the manuscript and the transmission of the text, see L D Reynolds, *Texts and Transmission A Survey of the Latin Classics* (Oxford Clarendon Press, 1983), pp xxxvii and 33–34

[10] Paris, B N lat. 16089, f 113, Oxford, Exeter College 35, f 227v, London, B L Harley 3542, f 97v, and Salzburg, Museum Carolino-Augusteum 2171, ff 180–180v In the last manuscript the text is headed *Incipit tractatus brevis et utilis De decoratione et ornatu mulierum Reichardi medici experti* In all four manuscripts the text has been badly distorted in transmission, and my edition is conjectural in places The possibility that Ricardus Anglicus was the author is worth exploring further Munich, CLM 444, f 208 also contains this prologue, but I received a microfilm too late to include its readings in this edition

ornatu under chapter headings he thought appropriate.[11] Practically all of the material which appears in the manuscripts is in the printed text, but in an arrangement of Kraut's creation. He thereby obliterated the stylistic distinctions in the material and for centuries confused readers, who thought they were reading a unified work by a single author. All later editions followed or indeed pirated Kraut's edition of 1544, to which he gave the title *De passionibus mulierum* or *The Diseases of Women*

The Trotula texts were extremely popular in the thirteenth, fourteenth and fifteenth centuries; in fact, separately or together they became the most widely circulated medical work on gynecology and women's problems. I am aware of nearly one hundred extant manuscripts containing one or (usually) more of these three texts, and there are doubtless others to be found. A Latin verse translation was written in the thirteenth century, an Irish translation in the fourteenth, and in the fifteenth century works attributed to Trotula were translated or rewritten into French (both prose and verse translations), English, German, Flemish and Catalan.[12] By the end of the thirteenth century the name of Trotula had become famous. In the *Dict de l'Herberie* of Rutebeuf, a medical charlatan making his spiel tells his audience that he has been sent by "ma dame Trote de Salerne," "the wisest woman in the whole world."[13] Chaucer put her in distinguished company as one of the authors included along with Tertullian, Heloise, Ovid, Chrysippus, and Solomon in the "book of wikked wyves" from which the Wife of Bath's fifth husband used to read[14]

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[11] Kraut was a physician from Hagenau His edition appeared as *Trotulae curandarum aegritudinum muliebrum liber* in *Experimentarius medicinae* (Strassburg apud Joannem Schottum, 1544), pp 3–35 Paulus Manutius labeled his reprinting of this work as *nusquam antea editus,* corrected the chapter numbers of his edition, but otherwise changed little else and used no new manuscripts in *Medici antiqui omnes* (Venice Aldus, 1547), ff 71–80v Other editions, such as those of Benedictus Victorius, *Empirica* (Venice, 1554), pp 460–525 and Hans Kaspar Wolf, *Harmonia Gynaeciorum* (Basel, 1566), cols 215–310, and their numerous reprintings, repeat the text of the Kraut edition with occasional misprints or "corrections" I have consulted and compared the copies in the National Library of Medicine, Bethesda.

[12] The Latin verse translation is printed in Salvatore De Renzi, *Collectio Salernitana,* 5 vols (Naples, 1852–59, rpr Bologna Forni Editore, n d), 4 1–24 An Irish translation of *Cum auctor,* preceded by a translation of *De gradibus* dated 1352, has been edited by Winifred Wulff as *A Mediaeval Handbook of Gynaecology and Midwifery* in *Irish Texts Fasciculus V,* ed John Fraser, Paul Grosjean, and J G O'Keeffe (London Sheed & Ward, 1934), pp 12–54 There is a French translation in Paris, Bibliothèque Ste-Geneviève 1057, f 20ff (which I have not seen), a literal prose translation in Paris, B N ms fr 1327, ff 61–117 (closely related to the Latin of the N Y Academy of Medicine ms cited in n. 10), and a verse translation in Cambridge, Trinity College 0 1 20, cited by Paul Meyer in "Les manuscrits français de Cambridge," *Romania,* 1903, *32* 87–90 The fifteenth-century German translation by Dr Johann Hartlieb exists in many manuscripts, including Baltimore, Johns Hopkins Institute of the History of Medicine, ms 3, ff 69–109v, see Henry E Sigerist, "Johannes Hartlieb's Gynaecological Collection," in *Science, Medicine and History Essays in Honor of Charles Singer,* ed Edgar A. Underwood, 2 vols (London Oxford University Press, 1953), 1 231–46 There is a Catalan translation of *De ornatu* in a fifteenth-century manuscript, Madrid, Biblioteca Nacional 3356, ff 1–32v, accompanied by a Catalan translation of a work of erotica, the *Speculum Alfoden,* see A. Paz y Mélia, "*Trotula,* por Maestre Joan," *Revista de archivos, bibliotecas y museos,* 1897, *1* 506–12 An English translation appears in two fifteenth-century manuscripts, Oxford, Bodley ms 483, ff 82–117 and Douce ms 37, ff 1–42 Beryl Rowland's *Medieval Woman's Guide to Health The First English Gynecological Handbook* (Kent, Ohio Kent State University Press, 1981) is not an edition of this work, but of another gynecological treatise in B L. Sloane 2463 I have no idea why she calls that text the "first." The Flemish *Liber Trotula* (Brugge, Stadsbibl ms 593), published by Anna Delva, *Vrouwengeneeskunde in Vlaanderen tijdens de late middeleeuwen,* Vlaamse Historische Studies (Brugge Genootschap voor Geschiedenis, 1983), is a very free translation and adaptation

[13] "La plus sage dame qui soit enz quatre partie dou monde" in *Oeuvres complètes de Rutebeuf,* ed Edmond Faral and Julia Bastin, 2 vols (Paris, A. & J Picard, 1959–60), 2 276–77

No one seems to have doubted that the works attributed to Trotula were written by a woman until 1566, when Hans Kaspar Wolf of Basel in his edition declared that *De passionibus mulierum* was the work of Eros Juliae, a Roman freedman of the first century A.D.[15] This particular bit of unsupported nonsense was the first salvo in a continuing attack on Trotula's existence, or at least on her gender. Wolf's position has been frequently criticized, however, and historians of medicine have regularly included Trotula in lists of women physicians.

Today the question of Trotula's identity remains a subject of controversy, with three major positions being championed. The first and most widely repeated is that Trotula is a well-documented historical figure who lived in the eleventh century and who is sometimes cited as a member of the faculty of the medical school of Salerno or the first woman professor of medicine. According to the retrospective *World Who's Who in Science,* she came from the Ruggiero family of Salerno, was born about 1050, and was married to a physician named Joannes Platearius.[16] Other authors say that she flourished around 1050, rather than being born then. Sometimes we are told that she died in 1097, and Mason-Hohl adds that she was followed to her grave by a funeral procession two miles long One could hardly ask for more precise identification, if in fact these statements are based on solid evidence.

The second position, advanced by Conrad Hiersemann, a student of the great German historian of medicine, Karl Sudhoff, is that there was an eleventh- or twelfth-century physician and author with a name like Trotula, but this author was in fact a man named Trottus. This position is based on a famous manuscript of Salernitan medical texts, once in Wrocław (Breslau) and now apparently destroyed, in which passages from an otherwise unknown author are identified by abbreviations such as *Tt* and most particularly *Trot,* followed by abbreviation marks which Hiersemann interpreted as representing the masculine *-us* ending.[17]

The third position, recently brought forward by Beryl Rowland, is that the name Trotula is not that of a real person but is related to the French verb *trotter,* to run about (as in the proverb *besoin fait vieille trotter*), and is echoed in the names of Trotaconventos, the old procuress in the *Libro de Buen Amor* of Juan Ruiz, and of the Dame Trot of English nursery rhymes.

> The widespread use of the word "Trot" and its associations with expertise in feminine matters may explain why a number of manuscripts variously treating

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[14] Wife of Bath's Prologue, 11 676–685, of the authors whom Chaucer cites here, the Stoic philosopher Chrysippus alone seems out of place as the author of a work a fourteenth-century student of women might have read

[15] *Harmonia Gynaeciorum,* cols 215–216

[16] *World Who's Who in Science,* ed. Allen G Debus (Chicago Marquis-Who's Who, 1968), p 1688

[17] Conrad Hiersemann, *Die Abschnitte aus der Practica des Trottus in der Salernitanischen Sammelschrift "De Aegritudinum Curatione,"* Inaug-Diss (Leipzig Institut für Geschichte der Medizin, 1921), p 6

> of women's diseases came to be ascribed to her Although women doctors certainly did exist in the Middle Ages, there appears to be no firm evidence that Trotula was one of them My own findings do not add another proverbial nail; they tend to deprive her even of her coffin[18]

Here I will argue that there is something wrong with all three of these positions. First of all, I have to say that the commonly presented biography of an eleventh-century Trotula is a tissue of ill-founded assertions created largely by enthusiastic amateurs and local historians.

With respect to the statement that Trotula came from the Ruggiero family of Salerno, I can find no author who cites a scrap of medieval evidence. The idea may have been based on the assumption that since the Ruggiero family was extremely important, Trotula should have come from it and therefore did. As far as I have been able to determine, the first person to assert that Trotula was a Ruggiero was Enrico or Heinrich Baccus, a German printer in Naples in the early seventeenth century, who wrote a *Nuova descrittione del regno di Napoli* (Naples, 1629). In his list of the leading people produced by Salerno he included "Trotta or Trottola di Ruggiero, who wrote a book concerning the diseases of women (*de morbis mulierum*) and another on the composition of medicines (*de compositione medicamentorum*)."[19] This unsupported assertion by Baccus probably lies behind a similar statement made in 1817 by Fr. Nicolà Columella Onorati in a biographical dictionary of illustrious men of the kingdom of Naples. Columella Onorati needed no more evidence than a handwritten note in his personal copy of the *Diseases of Women* which identified the author as "Trottula of the Roggeri family of Salerno, distinguished equally for its antiquity and its nobility."[20] And so it has gone, with assertions repeated until they became accepted as unquestioned fact.

As for the idea that Trotula was the mother of Matthaeus Platearius (supposedly the author of a twelfth-century herbal named *Circa instans*), and therefore the wife of Joannes Platearius, this was a conjecture, clearly labeled as such, of that prolific but unreliable nineteenth-century historian of the medical school of Salerno, Salvatore De Renzi De Renzi noted that *Circa instans* (as printed) refers to the mother of Matthaeus and Joannes Platearius as a physician, and assuming that it was unlikely that there would have been two distinguished women physicians in Salerno at the same time, concluded that Trotula and the mother of the Platearius brothers were probably the same person. That supposition could bear no weight unless it was buttressed by other evidence (which it has not been), and it would have no force at all unless it seemed likely that Trotula lived at the same time as the wife of Joannes Platearius. De Renzi, I should add, did not consider that Trotula, in his opinion surely author of the "Trot' " selections in the Wrocław *Codex Salernitanus,* was also the author of the *Trotula major* and *minor* Those works he considered compilations made by someone about 1200 who used the work of an eleventh-century physician named Trotula.[21] My point here is not that De Renzi was wrong or that his statements are inherently improbable, but that his assertions were not supported by solid evidence. As we shall see, his conclusion that "Trot' " was a female physician of the period of *Hochsalerno* and that the "Trotula" treatises were written around 1200 is probably correct.

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[18] "Exhuming Trotula, *Sapiens materna* of Salerno," *Florilegium*, 1979, *1* 52, the word *materna* in this title is presumably based on a misreading of the word *matrona* in Ordericus Vitalis Rowland repeats her argument in *Medieval Woman's Guide*, pp 3–6 In her book, p 49, n 14, she cites Edward F Tuttle, "The *Trotula* and Old Dame Trot a note on the Lady of Salerno," *Bull Hist Med*, 1976, *50* 61–72 and says that he "reaches conclusions very similar to my own." In fact, in his intelligent and useful article, Tuttle says that "Trotula" was "in all probability the name of a Salernitan *matrona* or midwife" (p 68, n 28) and urges caution "in relating Dame Trot to Trotula" (p 72)

[19] I quote from the seventh printing, Naples, 1671, p 156, from a copy kindly supplied by Dr Thomas Waldman A somewhat expanded version appears in a Latin translation, *Nova descriptio regni Neapolitani*, reprinted by J G Graevius in the *Thesaurus antiquitatum et historiarum Italiae, Neapolis, Siciliae, etc*, vol 9, part 1 (Leiden, 1723), col 42 I have no idea what work on the compounding of medicines Baccus may have had in mind.

[20] *Biografia degli uomini illustri del regno di Napoli*, 10 vols (Naples, 1813–26), 4 s v "Trotola."

And so we come to the third alleged biographical datum, the assertion that Trotula lived in the eleventh century, in fact, in the mid-eleventh century. This idea stems from a passage in the *Ecclesiastical History* of Ordericus Vitalis, who reports that Ralph Mala-Corona, a worldly cleric and skilled physician, visited Salerno some time before 1050 and "found no one there as learned as he in the art of medicine except a certain learned woman" (*sapiens matrona*).[22] Again, the principle of economy has been applied. How many learned women can there have been at Salerno? Knowing the name of but one, historians have assumed without supporting evidence that this *sapiens matrona* was Trotula. And once one felt confident, however unjustifiably, that Trotula lived in the eleventh century, one could then build on this assumption. De Renzi cited as an example of the appearance of the name "Trota" in the eleventh century a reference to an act of 1097 in which Roger (Ruggiero), lord of Castello di Montuori, made a donation to the monastery of Cava, releasing the usufruct of his mother Trotta.[23] Mead repeats the reference, adding that Trotta "may have died the same year."[24] This statement in turn appears to be the basis for Mason-Hohl's assertion that Trotula died in 1097. For her colorful detail about the funeral procession two miles long, I can find no evidence whatsoever.

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[21] Salvatore De Renzi, *Storia Documentata della Scuola Medica di Salerno,* 2nd ed (Naples, 1857, rpt Milan Ferro Edizioni, 1967), pp 194–208, this is a revised version with additions of *Coll Sal,* 1 149–161 There is no modern edition of *Circa instans* On the passages used by De Renzi to support his argument, see Walter Starkenstein, "Ein Beitrag zur 'Circa instans'-Frage," *Archiv Gesch Med*, 1935, *27* 375–76 The Starkenstein manuscripts have recently been acquired by the Library of the New York Botanical Gardens, see Eugenia D Robertson, "*Circa Instans* and the Salernitan *materia medica,*" (Ph.D diss , Bryn Mawr College, 1982), pp 104–6 I am grateful to Mrs Lothian Lynas for sending photographs of these manuscripts which allowed me to verify that the mother of the Platearii was not called a *magistra* in these passages

[22] *The Ecclesiastical History of Ordericus Vitalis,* ed. Marjorie Chibnall, 6 vols (Oxford Clarendon Press, 1969–80) 2 28 and 74–76 Though it is frequently said that Ralph visited Salerno about 1059, the *eodem tempore* which provides that date refers to the year when Ralph left Marmoutier and became a monk at St. Evroul, not to the time of his visit to Salerno Ordericus gives contradictory information about the date of Ralph's monastic profession at Marmoutier, he probably became a monk somewhere between 1052 and 1055 (see pp 28 and 76) Ralph's time of study (and also warfare?) in Italy apparently occurred well before he retired from the world, perhaps in the 1030s, when the Normans established their power at Aversa. Charles H Talbot suggests, probably incorrectly, that *sapiens matrona* should be translated as *sage-femme* in "Dame Trot and her progeny," *Essays and Studies,* 1972, *25* 1 Michel Salvat, "L'accouchement dans la littérature scientifique médiévale," *Senefiance,* 1983, *9* 92, shows that the term *sage-femme* only appeared in the later Middle Ages, and so Ordericus could not have had it in mind when he wrote in the twelfth century

As for the third position, that there never was a female physician named Trotula or Trota and that her myth was a response to the semantic pull of the word *trot* and in association with the traditional figure of the Old Whore who appears in Ovid, the *Roman de la Rose,* etc., this view seems to me quite unnecessary, since it ignores the evidence for the existence of an actual person named Trota or Trotula. Let us now see what we can learn about such a person from reasonably solid evidence.

First of all, the woman's name "Trota" was common in Southern Italy and specifically in Salerno in the period which interests us.[25] The membership rolls of the confraternity of the cathedral of Salerno from the eleventh to the thirteenth century contain references to some seventy women named Trota or Trocta.[26] None of these women, alas, was named as a physician or as the wife of one, though another woman, Berdefolia, was identified as a physician or *medica.*[27] The obituary rolls also mention a man with the intriguing family name of Trotulus.[28] Trotula as a diminutive means "little Trota," "dear Trota" or even "old Trota"; moreover, the form could be used in creating a book title, a point to which we shall return. Given the frequent use of the name Trota, we should not be surprised to find that the physician who interests us bore that name, and there is no reason to think that it is derived from the verb for "trot." In fact, references to Old Trot, etc. may well receive some of their force from the existence of the Trotula texts.

What evidence is there for the existence of a woman physician named Trota or Trotula? The one reasonably solid piece of evidence on which attention has focused up to now appears in *Ut de curis* In the form of this text given in the two oldest manuscripts known to me, this treatise tells us how a physician named Trota made her reputation. An unnamed girl was supposed to be "cut," we are told, because of misdiagnosed wind or gas in the uterus. "Hence it came about that Trota was called—so to speak—a female master (*Unde contingit quod Trota vocata fuit tanquam magistra*)", she took the girl into her home, treated her with a bath in which mallows and pellitory had been cooked and with a plaster made of radish juice and milled barley, and this cured her.[29] The same story appears in two manuscripts of the second and third quarters of the thirteenth century, where the physician is named "Domina Trotula" and we are told that she was called "*quasi magistra*"—"as if she were a female master."[30]

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[23] De Renzi, *Storia documentata,* pp 198 and XXXIX, document 42, citing Arch Cavense Arca D no 152 Document 43 refers to a Trotta in 1105 who was the sister of a physician named Landulfo

[24] Kate Campbell Hurd-Mead, *A History of Women in Medicine from the Earliest Times to the Beginning of the Nineteenth Century* (Haddam, Conn Haddam Press, 1938, rpt. Dover, N H Longwood Press), p 128

[25] In late Latin "trocta" means "trout," which is what *trotta* still means in Italian today "Trout" seems an odd baptismal name for a woman, and as a proper name it may have had some other origin

[26] *Necrologio del Liber Confratrum di S Matteo di Salerno,* ed. Carlo Alberto Garufi, Fonti per la storia d'Italia (Rome Tip del Senato, 1922)

[27] *Ibid,* p 62 George W Corner, "The rise of medicine at Salerno in the twelfth century," *Ann Med Hist,* n.s , 1931, *3* 14, is in error in saying "The Registers and Obituary of the Cathedral, which name many doctors and women of all ranks, do not apply the title *medica* to a single woman "

[28] *Ibid,* pp 110, 134 Though it might be imagined that there is some connection between Trotulus and Trotula, it must be stressed that there is no evidence at all that the Trotulus of the necrology was a physician.

The point of this story is, of course, that a woman effected a gynecological success not achieved by men. It is evidence of Trota's reputation, but it also reveals how unusual her situation was. *Magistra,* a feminine form of *magister,* is an unexpected word in a medical context, perhaps even a neologism, and *tanquam* calls attention to its rarity; as one dictionary tells us, *tanquam* is "used to introduce the application of a term to something which is not properly so called."[31] In other words, a woman was not properly a master, but Trota's reputation was so great that an unusual term had to be created to express her situation as a female near-equivalent to men who held that position.

From this anecdote we may turn back to the now lost Wrocław codex, which on paleographic grounds can be dated about 1200. This manuscript contained an extremely important compendium of extracts called *De aegritudinum curatione,* made up of the work of a group of well-known Salernitan masters named in rubrics and marginal annotations, Joannes Afflacius, Copho, Petrocellus, Platearius (whichever member of the family wrote the *Practica brevis,* which is excerpted here), Bartholomeus and Ferrarius, plus a series of extracts attributed to an author designated in the rubrics as "Trot'," "Tt," or some similar form. In addition, many passages bear no indication of authorship; some have been shown to come from the *Viaticum* of Constantine. Conrad Hiersemann, who prepared a careful edition of the extracts labeled "Trot'," pointed out that there is no correspondence between the remedies attributed to "Trot' " and those in the Trotula texts known to him, and that except for one prescription for vomiting to induce a woman to expel a still-born fetus, none of the extracts labeled "Trot' " has anything to do with gynecology, obstetrics or the specific interests of women. This observation provides a form of negative support for his conclusion that the Trot' of the Wrocław codex should be considered a male physician.[32]

On the basis of these extracts Hiersemann concluded that the therapy advocated here was never "senseless" and that the author was a "skilled practitioner who practiced scarification, phlebotomy and physical medicine *lege artis*" He also noted one curious distinction in the labeling of these extracts.[33] When the scribe of the Wrocław manuscript identified his selected passages with abbreviated names entered in the margin, usually these names were preceded by the initial *M,* meaning *magister.* Thus we have "M J A" for "magister Joannes Afflacius," "M. Plat'" for "magister Platearius," "M. Bart'" for "magister Bartolomeus" Once or twice the *M* was omitted, but in practically every case it was there. But for one set of entries an *M* never appeared, and that was for "Trot'" If we are to judge from this consistent practice in *De aegritudinum curatione,* "Trot'," whoever she or he was, was not a master

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[29] London, B L Sloane 1124, f 173 and N Y Academy of Medicine ms SAFE, f 77v "Unde contingit quod Trota vocata fuit tanquam magistra, cum quedam puella propter ventositatem debuit incidi quasi ex ruptura laborasset, et admirata fuit quamplurimum " Cf Kraut, ed., *Trotulae,* chap 20

[30] Leipzig ms 1215, f 66v and Ms *A,* f 82ra. Some later manuscripts have "quasi magistra operis" or "quasi magistra huius operis " It seems to me likely that *tanquam* was the original form, later replaced by *quasi,* which means almost the same thing

[31] *Oxford Latin Dictionary* (Oxford Clarendon Press, 1982), s v *"tamquam "*

[32] August W E Theodor Henschel discovered the codex and published an unfortunately faulty text of *De aegritudinum curatione* in De Renzi, *Coll Sal*, 2 81–386 Hiersemann's edition of the "Trot' " excerpts in his Leipzig dissertation, *Abschnitte aus der Practica des Trottus,* pp 10–21, is a distinct improvement See pp 7–8 for the points made here For a description and analysis of the manuscript see Karl Sudhoff, "Die Salernitaner Handschrift in Breslau," *Arch Gesch Med*, 1920, *12* 101–47 Sudhoff dated the manuscript 1160–70, but on the basis of the photographs Sudhoff published, Professor Rouse prefers a slightly later date, in the period 1185–1215, though more likely in the late twelfth century because of the small, compressed size

Up to this point, then, the only evidence historians have had testifying to the existence of an actual practitioner named Trota or Trotula or anything of the sort is the passage in *Ut de curis* about Trota acting *tanquam* or *quasi magistra* and the ambiguous Wrocław manuscript. To this material can now be added a previously unnoticed text. It appears in a manuscript, now in Madrid, which was written by a northern French or English scribe about 1200. The Madrid manuscript is therefore contemporary with the Wrocław codex and with the oldest manuscripts which contain *Cum auctor* or *Ut de curis.*

The Madrid manuscript is an easily portable physician's handbook containing a collection of Salernitan medical texts, including several translations by Constantine the African and a treatise by Johannes de Sancto Paulo, a Salernitan physician and author whose work also appeared in the Wrocław manuscript;[34] it closes with a work identified in the margin in the scribe's hand as *Practica secundum Trotam* and in its later (early thirteenth-century) rubric as *Practica secundum Trotulam* This treatise begins "According to Trota in order to bring on menstruation when a woman cannot conceive because of its retention" (*Secundum Trotam ad menstrua provocanda quorum retentione mulier concipere non potest*) and continues for four folios with remedies and medical advice concerning gynecology, the care of children, beauty, and a large number of topics which concern men as well as women, such as vomiting, insanity, scrofula, piles and snake-bite. In a number of the chapters the masculine gender is used to refer to the patient.[35]

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of the script. In his opinion the writing is that of northwest France or Norman England The crude, "Romanesque" style of the miniatures also suggests composition in the twelfth rather than the thirteenth century

[33] Hiersemann, *Abschnitte,* pp 7 and 9

[34] The *Liber de simplicium medicinarum virtutibus* of Johannes de Sancto Paulo, which appears anonymously in the Wrocław manuscript, is edited by Georg Heinrich Kroemer, Inaug -Diss (Leipzig Institut für Geschichte der Medizin, 1920), the text in the Madrid manuscript is his *Flores dietarum,* ed. Hermann J Ostermuth, Inaug -Diss (Leipzig Institut für Geschichte der Medizin, 1919) Johannes was active as a physician in the twelfth century, see Ernest Wickersheimer, *Dictionnaire biographique des médecins en France au moyen âge,* 2 vols (Paris E Droz, 1936, rpt. Geneva Librarie Droz, 1979) 2 480–81

[35] Madrid, Biblioteca de la Universidad Complutense, ms 119 (formerly 116-Z-31), ff 40–44v. I would not have been aware of the existence of this extremely important text if it were not for the reference to it by Guy Beaujouan, "Manuscrits médicaux du moyen âge conservés en Espagne," *Mélanges de la Casa de Velázquez,* 1972, *8* 199 (here called a copy of the *Trotula minor*) I am grateful to Dr Cecilia Fernandez

The most remarkable feature of this text is that almost half of the material which appears in the *Practica secundum Trotam* is also to be found in *De aegritudinum curatione.* Two of these chapters are in paragraphs which were labeled "Trot' " in the Wrocław codex. With one exception, the others appear in sections where no author was given, or appear at the end of chapters, after the work of a named author has ended. A comparison of the two texts makes it clear that a large amount of the anonymous matter in *De aegritudinum curatione* is by the author of the Madrid *Practica* Much of this previously anonymous material is specifically concerned with women and appears under such headings as "Ad menstrua restringenda," "De purgatione mulieris post partum," and "De albificanda facie." Hiersemann's most convincing non-paleographic reason for concluding that "Trot' " was male is therefore eliminated.[36]

A full discussion of the nature of the *Practica secundum Trotam* and its relationship to *De aegritudinum curatione* must await the publication of the new text On the basis of the comparison I have made, it seems safe to say at this point that since the "Trot' " selections in the Wrocław manuscript and the text in the Madrid manuscript both contain identical passages and yet each contains chapters not in the other manuscript, both were drawn from a larger work, a "Practica" similar in its form to those of Platearius and Bartholomeus. The Madrid manuscript is quite explicit in attributing this work to a woman, Trota, whose name is twice spelled out in full.

The scribe of the Wrocław manuscript always abbreviated this name, but I am not convinced that his abbreviation indicates that he thought the author was a man, and it seems to me likely that Hiersemann was mistaken in interpreting the abbreviation as a masculine *-us* ending. Hiersemann describes the mark which interests us as "sometimes a comma, sometimes a flourish, sometimes a line." I suggest that it was a simple mark of suspension, a common scribal practice to indicate that a familiar name had not been completed, just as the same scribe wrote "Plat' " for Platearius, "Petro' " for Petrocellus, "Ferr' " for Ferrarius, etc.[37] Hiersemann made the mistake of

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Fernandez for permission to see the manuscript in November 1983 and to have a microfilm prepared I intend to publish an edition and discussion of the *Practica* and a description of the manuscript elsewhere

[36] As examples of correspondence between the *Practica* (*P*) and *De aegritudinum curatione* (*DAC*), I will cite here only the passages edited by Hiersemann, *Abschnitte,* with the differences in italics 1 *P* (fol 142) "Ad vomitum restringendum, accipe oleum et acetum et simul bullias, *et ibi* spongiam intingas et pectori *ap*ponas, et restringetur" *DAC* (p 15, 11 19–20) "Ad vomitum restringendum, accipe oleum et acetum et simul bullias, *deinde* spongiam intingas et pectori *super*ponas, et restingetur", 2 *P* (fol 141v) "Ad cancrum, si in gingivis vel labiis fuerit. In principio loca patientia lavabis, et postea fricentur cum al*b*umine *ovi desiccato et* subtiliter pulverizato, *et* hoc assidue *facias,* et sanabitur" *DAC* (p 13, 11 37–39) "Ad cancrum, si in gingivis vel labiis *vel dentibus* fuerit. In principio loca patientia *bene cum aceto* lavabis, et postea fricentur cum alumine subtiliter pulverizato, hoc assidue fac et sanabitur *cancer*"

[37] *Abschnitte,* p 6 Unfortunately Sudhoff did not publish a reproduction of the hand which wrote *De aegritudinum curatione* (see Sudhoff, "Salernitaner Handschrift," p 191) and the lithographic reproductions appended to August Henschel, "Die Salernitanische Handschrift," *Janus,* 1846, *1* 40–84, 300–68 are also of no help Henschel had no doubt that "Trot' " should be expanded to Trotula, on this and the abbreviation of the other names see pp 329–30 When Hiersemann wrote his dissertation, he was not an experienced paleographer or medievalist, but a twenty-eight-year-old medical student. Sudhoff, his dissertation director, accepted the reading of "Trotus" in "Salernitaner Handschrift," p 128, but seemingly with caution

concentrating on the abbreviation of one name alone, rather than taking account of the scribe's abbreviation of other names, and he was probably influenced by finding no passage marked "Trot' " which showed a particular concern for women's medicine or appeared in the treatises attributed to Trotula. Faced with the evidence of the Madrid text, the abbreviation used in the Wrocław manuscript does not constitute a sufficient reason to argue that "Trot' " was male.

Three chapters of the *Practica secundum Trotam* provide a problem of attribution. These chapters (*De conceptu, De matricis humiditate,* and *De vicio viri*) appear in *De aegritudinum curatione* as one long chapter ascribed to "M[agister] C[opho]." Stylistically this material differs from the other chapters in the *Practica secundum Trotam;* it is more fully developed and theoretical, and it uses the verb *precipere* three or four times, a word which does not appear elsewhere in Trota's chapters. Since the *Practica* of Copho has not survived, the attribution of the Wrocław manuscript cannot be verified, but it seems reasonable to assume that either Trota or the author of the Madrid summary of her work borrowed this material from Copho.[38] These same three chapters appear as the final three chapters in most manuscripts of *Cum auctor.* Since the author of *Cum auctor* shows no other evidence of familiarity with the *Practica secundum Trotam,* it seems to me likely that these chapters were borrowed from Copho rather than from Trota. The authors or compilers of the three "Trotula" treatises drew upon a number of earlier works, but there is no compelling evidence that the *Practica secundum Trotam* was one of them.[39]

On the whole, the remedies prescribed in the *Practica secundum Trotam* differ from those in the three texts attributed to Trotula which we have considered earlier. When the subject matter in the *Practica* is the same as that in one of the three other treatises, it commonly is less complex and differs in the *materia medica* prescribed, and when the remedies are reasonably close, there is still a distinct difference in wording which suggests the independent repetition of a common prescription. *Cum auctor* and *Ut de curis* are both far more systematic and fully developed gynecological works; they present a more "learned" level of academic medicine than the *Practica,* which on the whole seems to represent the traditions of empirics and midwives.

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[38] *Coll Sal*, 2 342–43 = *Practica,* fols 142v–143 The work which De Renzi publishes as that of Copho in *Coll Sal*, 4 415–505 does not correspond to anything attributed to Copho in *De aegritudinum curatione* and was probably written by Archimatheus, see Friedrich Hartmann, *Die Literatur von Fruh- und Hochsalerno und der Inhalt des Breslauer Codex Salernitanus,* Inaug -Diss (Leipzig. Institut für Geschichte der Medizin, 1919), pp 14–15

[39] On the sources of "Trotula" see Hermann Rudolf Spitzner, *Die Salernitanische Gynakologie und Geburtshilfe unter dem Namen der "Trotula,"* Inaug -Diss (Leipzig Institut fur Geschichte der Medizin, 1921), pp 29–36 The question needs to be re-examined after an edition of the texts has been established. Spitzner (p 29) cites a couplet from the *Regimen Salernitanum* which appears in chap 29 of the printed text and which should help to date the work, but this passage does not appear in any of the manuscripts I have collated and must be considered an addition

It is the evidence of the Madrid manuscript which will allow us for the first time to write with some confidence about Trota as an historical figure in the history of medicine. Rather than citing that text in further detail, here I will only summarize the more general conclusions I have reached from reading the available material. I begin with the evidence that in the eleventh and twelfth centuries there were a number of women healers in Salerno, the frequently cited *mulieres Salernitane,* and that some of them were distinguished for their medical skill. We have already met Berdefolia *medica;* Ordericus Vitalis tells us of an eleventh-century *sapiens matrona* who greatly impressed Ralph Mala-Corona, a noted physician in his own land; Matthaeus Platearius cites his mother as a physician, and we have no reason to think that these references are all to the same person or that they are in any way exhaustive. The methodological error of De Renzi—and even more obviously of others who have gone beyond his lead—was to assume that the scattered evidence which has survived from the past was produced by a very limited cast of characters, so that a fact here and a reference there can all be used to write a biographical sketch, without the necessity of a close demonstration of the relationship of the different parts

The texts of the *Practica secundum Trotam* and the "Trot' " sections of *De aegritudinum curatione* together establish that Trota produced a larger *Practica,* which is now lost. She very likely was, as Hiersemann said of his masculine "Trottus," a skilled and sensible physician, but the missing *M* in the Wroclaw manuscript suggests that she was not accorded the title of master. Since her *Practica* shows some influence from the work of Constantine and incorporates chapters from Copho, she may be considered to have been active in the twelfth rather than in the eleventh century; indeed, she may still have been alive at the end of the twelfth century when the Madrid and Wroclaw manuscripts were written Though her work was obviously valued at that time, as those two manuscripts (as well as the reference in *Ut de curis*) show, it was apparently rarely copied in later centuries and was replaced by more learned, complex and theoretical medicine.

Two pieces of evidence, each uncertain, suggest a relationship between Trota and Johannes Furias, a little known physician who probably lived in the twelfth century. In a section on the care of the eyes in *De aegritudinum curatione* which Hiersemann prints as the work of "Trot'," there is a reference to a cure used for fifteen years by Johannes Furias. This is the only reference to a contemporary in any passages attributed to Trota, and if it is indeed hers, it could help to date her work.[40] Johannes Furias is cited in the "German Bartholomeus," a macaronic German-Latin medical work which has preserved traces of material no longer extant in Latin. Several manuscripts contain a recipe for a depilatory which Johannes Furias is said to have sent to "his friend, called Cleopatra." What makes this reference intriguing is that the recipe is a German version of one which appears in Latin in the *Practica secundum Trotam.*[41] With this text in mind one wonders if Johannes and Trota were in fact colleagues and if she was known familiarly by the name claimed by the author of a late antique or early medieval work on gynecology which was attributed to Cleopatra, *medica reginarum.*

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[40] Hiersemann, *Abschnitte,* p 12, lines 39–48, see also p 22 The passage is in a section on the care of the eyes which is not labeled "Trot'," but which follows another which is

The texts which can be attributed to Trota with reasonable security strongly suggest that she did not write the three widely circulated treatises which have so long been attributed to her These treatises are difficult to date more precisely than to sometime in the twelfth century, or possibly very early in the thirteenth. As stated before, the earliest manuscripts were probably written at the beginning of the thirteenth century, or just possibly in the closing years of the twelfth. *Cum auctor* draws heavily on the work of Constantine, the reference to Ferrarius shows that *Ut de curis* must have been written after the beginning of the twelfth century, and *De ornatu* quotes from the preface to Hippocrates' *Prognostica* in the translation attributed to Constantine and given wide circulation by its inclusion in the *Articella.* It seems to me likely that all three works were composed not long before the time of the earliest existing manuscripts, that is, in the late twelfth century, or possibly at the very beginning of the thirteenth. No manuscripts have been found from the early or mid-twelfth century, and I have found no reference to these treatises in twelfth-century library catalogues[42] Moreover, no author before the thirteenth century cites "Trotula" or quotes from these texts. For example, Bernard of Provence, who wrote at the end of the twelfth century, cites the *mulieres Salernitane* more than a dozen times, without ever mentioning the name of Trotula, and the recipes he attributes to these women are quite different from those which appear in the treatises.[43]

There may be some significance in the fact that one of the earliest manuscripts seems to come from southern France. Salerno was sacked by Emperor Henry VI in 1194 and in the thirteenth century the university appears to have been in a period of decline. Both Montpellier and Paris benefited from the decline of the Italian city as a center for medical education. It would be plausible to imagine that Salernitan masters or students brought these works with them to Montpellier or produced them there, and that from Montpellier they made their way to northern France and to England, the center of their greatest popularity and diffusion in the thirteenth century.[44]

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[41] Christian Graeter, *Ein Leipziger deutscher Bartholomaeus,* Inaug -Diss (Leipzig Institut für Geschichte der Medizin, 1918), pp 48–49, quotes this passage "Ein meister hiez Johannes Furia, der schreip sîner friundinne, diu hiez Cheopatra (*sic*) diese erzenîe Er sprach " The recipe in the *Practica secundum Trotam* appears in almost precisely the same words in *De aegritudinum curatione* in De Renzi, *Coll Sal,* *2* 145

[42] For example, in the twelfth century the monastery of Saint-Amand owned copies of pseudo-Cleopatra's *Genecea* and of the "liber Muscionis de pessariis," but no "Trotula", see Gustav Becker, *Catalogi Bibliothecarum Antiqui* (Bonn, 1885, rpt. Brussels Culture et Civilisation, 1969), p 233 There is also no reference to her in Karl Sudhoff, "Die medizinischen Schriften, welche Bishof Bruno von Hildesheim 1161 in seiner Bibliothek besass, und die Bedeutung des Konstantin von Afrika im 12 Jahrhundert," *Arch Gesch Med*, 1916, *9* 348–56

[43] "Commentarium Magistri Bernardi Provincialis super Tabulas Salerni" in De Renzi, *Coll Sal*, 5 269–328 For example, the recipe of feeding asses' dung to their husbands he attributes to the women of Salerno (p 287) has no parallel in "Trotula." De Renzi found only one parallel passage worth noting (p 273), a short recipe which does appear almost verbatim in later manuscripts of *De ornatu* and in the printed version, chap 61 But this recipe is not in B N lat 16089 or B L. Harley 3542, which I consider to represent the primitive form of the treatise Many recipes were added to *De ornatu* in later manuscripts, and this one may have been borrowed from Bernard.

The authors of these three treatises were probably men. Since men controlled the academic medicine of the time, this supposition is a natural one, and it is supported by some evidence in the texts themselves. Though in late manuscripts adjectives referring to the author in the preface to *Cum auctor* use feminine endings, in the earliest manuscripts that preface is written without any grammatical indication of the gender of the author. The distancing implicit in the way the author writes about *their* diseases (*suarum, earum, in eis*) and says that the treatise was composed "largely at the request of a certain woman" (*maxime cuiusdam mulieris gratia*) suggests to me that the author was male, though these points are hardly conclusive. This author has little to say about childbirth itself and comments that it had been concealed from him how the empirical remedies used by midwives (such as a magnet held in the right hand) actually work.[45] If this tract was indeed written by a woman, I can find nothing in the text to indicate it. The longer, original form of the prologue to *De ornatu* shows that the author or compiler of this treatise was a man. Though *Ut de curis* contains no specific phrasing indicating the gender of the author, the fact that Trota was cited in the third person does imply that she was not the author of the tract.

If Trota was not the author, how did these treatises come to bear her name? In his *editio princeps* Georg Kraut noted his belief that the treatise was called *Trotula* because her name appeared in the text.[46] On this basis, however, *Ut de curis* could as well have been named after the better documented Copho or Ferrarius, and one must remember as well that eventually *Trotula major* and *Trotula minor* came to be applied to all three texts, though only one mentions the name of Trota.

"Trota" is the name used in the text of the Madrid *Practica,* and it is apparently the form originally used in the anecdote in *Ut de curis,* "Trotula" is the form used with overwhelming frequency by the scribes and rubricators who wrote the headings and explicits of the Trotula texts. It was common practice to form book titles in this fashion, so that the *Summa* of Angelus Carletti was known as the *Angelica,* that of Roland of Parma as the *Rolandina,* etc. One early thirteenth-century manuscript makes it clear that *Trotula* is the name of the work through its rubric: "Summa que dicitur Trotula."[47]

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[44] On the rivalry of Salerno and Montpellier and movement between the two see Karl Sudhoff, "Salerno, Montpellier und Paris um 1200," *Arch Gesch Med*, 1928, *20* 51–62

[45] "Notanda quedam que sunt phisicalia remedia, quorum nobis virtus est occulta, que ab obstetricibus profuerunt", ms *A* f 80rb or Kraut, ed, *Trotulae,* chap 16

[46] See Kraut's marginal note on p 27 of the Strassburg edition (chap 20) This is also the opinion of Tuttle in *"Trotula,"* pp 65–66

[47] On the adaptation of authors' names to titles see Paul Lehmann, *Mittelalterliche Buchertitel,* Sitzungsberichte der Bayerischen Akademie der Wissenschaften, Phil -hist. Kl, 2 vols (Munich· Verlag der Bayerischen

Though the evidence is sparse and subject to dispute, it appears that the name of a real twelfth-century author, Trota, was applied to a set of texts, the *Trotula major* and *minor*, in the thirteenth, and that by a process of back formation, the diminutive Trotula was then thought to be the proper name of the author.

The evidence of the manuscripts suggests that the name given to these texts was not a simple accident produced by the presence of the name Trota in *Ut de curis*. When these three texts devoted to women's medicine were brought together early in the thirteenth century and the gender-specific prologue to *De ornatu* was dropped in the compilation, it is not unreasonable to conclude that they were deliberately labeled with the name of the best known female physician of the previous century in order to give them greater credibility or acceptance.

Though they bear the name of a female author, I must say that throughout these three treatises I see no evidence of "the gentle hand of a woman" or that the medicine prescribed, as another writer has said, is "remarkable for its humanity."[48] The major sources of *Cum auctor* are the *Viaticum* and *Pantegni* of Constantine, and as we have seen, some material was probably borrowed from Copho; other medical treatments advocated here are similar to those one finds in the work of male doctors such as Platearius and Bartholomeus. The heavy baggage of Galenic theory, which treats women as "imperfect" and deficient in "innate heat" when compared with men, provides a conceptual frame of mind absent from the simple, non-theoretical treatment of the *Practica de Trota*[49] In *Cum auctor* and *Ut de curis* bleeding is prescribed for such conditions as excessive menstruation, and in this respect those treatises differ significantly from the *Practica secundum Trotam*, where bleeding is not prescribed for any gynecological problem. As had been advocated since the time of the ancient Egyptians, in the *Trotula major* and *minor* (and in the work of Trota) the womb is to be moved about by suffumigation, that is, having the patient sit over the smoke of sweet or foul-smelling substances. Poultices of various sorts of dung, cupping on the groin or pubis, and pessaries and douches made of such substances as pitch, honey, weasel oil, nutmeg and cloves are frequently advocated. As far as I can tell, with a few exceptions it would be a coincidence if a remedy prescribed here did some good, and many were unpleasant or even harmful.

Akademie der Wissenschaften, 1948–1953), 2 14 The manuscript cited is B N lat 7056 (Ms *A*), f 77 The same rubricator introduces *De ornatu* on f 84v as *Alius tractatus qui dicitur minor Trotula* and makes a clear analogy with the *Rogerina* of Roger Baron, see f 75 *Tractatus qui dicitur minor Rogerina.* Tuttle, however, has argued in *"Trotula,"* pp 66–67 that "Trotula" was probably the author's name and that *Trotula major* and *minor* are equivalent to the *Priscianus major* and *minor*

[48] The second quotation is from Susan Mosher Stuard, "Dame Trot," *Signs*, 1975, *1* 538

[49] The issue of Galenic theory itself does not, of course, indicate male authorship, since the thought of people of both sexes is normally dominated by the available theory of their times On the role of Galenic theory in ancient medicine and the treatises of "Trotula," I have benefited from the dissertation on gynecology from Galen to Trotula which Monica H Green is preparing at Princeton University

Academic medicine may even have been more harmful than the empiric practices of Salernitan herbalists, since it was more influenced by theory and farther removed from its practical roots by reliance on classroom instruction and the written treatise. To the degree that the *mulieres Salernitane* were skilled in herbal medicine and were the source of treatments advocated in these treatises, their "traditional" and occasionally effective medicine, tested by experience, was deformed and sometimes rendered dangerous by the process of literate transmission by academic physicians and professional scribes writing for an equally academic audience. Surely the best way to learn herbal medicine was from direct instruction. In manuscripts the symbols for ounces, drams, and scruples were confused with careless abandon (thus at times leading to the recommendation of massive overdosing with powerful herbs) and errors in transcription were common. In the copying of these texts, for example, through a misreading *fisalidos* was transformed into *siseleos*, directing later doctors, if they followed their instructions, to prescribe mountain brook-willow rather than drop-wort, a mistake which could not be made by herbalists working directly with the plants.[50]

At the beginning of this paper I said that learned medieval works on gynecology were largely written for men and contained the ideas of male physicians. *Cum auctor* and *Ut de curis* were written specifically for an audience of other physicians, and that audience was overwhelmingly male. The man who wrote *De ornatu* says in his prologue that he composed the work because women had often asked him for advice. He intended that treatise, which by our standards is only marginally medical, for a female audience. In its original form, recorded in the manuscripts which contain the long version of the prologue, the author addresses a female reader directly with such phrases as "ut sudes" and "abluas te optime," but in the text which became standard these second-person forms were changed to the third person.[51] The readers of all three treatises were normally male, for these Latin texts circulated with other works used by medical school graduates, and the owners which have been positively identified were men or (usually) male institutions. In the fifteenth century when vernacular gynecological and obstetrical treatises were written with an audience of women in mind, we find that some of these new texts differ from the Latin *Trotula* and pay more attention to the practical obstetrical problems which concerned female practitioners.[52]

A striking feature of the three treatises which have traditionally been attributed to Trotula is that they were so frequently copied and so widely disseminated. The existence today of nearly one hundred manuscripts shows that they became the standard gynecological texts of the late medieval medical profession, though I can find no evidence that they were assigned as school texts in any university. Indeed, the multiple reprintings of the sixteenth century demonstrate the continued importance of the works into the early modern period. Though a few of the earliest manuscripts are anonymous, later copyists, owners and readers assumed that they were dealing with texts written by someone named Trotula or Trota, and until Wolf's misguided and unconvincing attribution, no one doubted that these treatises were written by a woman. Trotula was, moreover, cited as an authority by such medical writers as Peter of Spain, better known as Pope John XXI.

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[50] *Fisalidos* is the reading in ms *A*, f 77vb, *siseleos* that of the Kraut ed, *Trotulae*, chap 1 On the two plants see *The Herbal of Rufinus*, ed Lynn Thorndike (Chicago. University of Chicago Press, 1946), pp 135 and 298

[51] See B N. lat 16089, f 113 and B L. Harley 3542, f 97v In the second fifteenth-century manuscript "ut sudes" remains in its original form, but "ungas" was corrected by the original scribe with a mark of deletion and a superscript *t* and "te" was overwritten to read "se" Ms *A*, an early manuscript of the version which brings all three treatises together, has third-person forms throughout.

[52] See the texts published by Delva and Rowland cited in n 12 above Delva argues that the Flemish *Liber Trotula* was written for an audience of midwives by a practicing midwife critical of male university masters

This authoritative use of treatises ascribed to a woman occurred at the very time that licensed women physicians were incredible rarities and university masters were prosecuting women for practicing medicine without a license. For example, in 1322 the masters of the Parisian medical faculty argued successfully that just as a woman was disbarred because of her sex from practicing law or testifying in a criminal case, there was all the more reason that she could be prohibited by law from the practice of medicine, "since she does not know through the letter or art of medicine the cause of the illness of the ill."[53] English physicians wanted a blanket prohibition against women in their field and in 1422 petitioned Parliament requesting the enactment of a statute which would bar men from practicing medicine without a university degree, under pain of imprisonment and a fine of forty pounds, and would insure "that no Woman use the practyse of Fisyk undre the same peyne."[54]

(pp 30–34) The author of the English text Rowland edited (B L Sloane 2463, ff 194–232) states that it was composed for the benefit of women ("and that oon woman may helpe another in her sykenesse & nought diskuren her previtees to such vncurteys men"—p 58), but Rowland makes far too much of the unusualness of this work, for much of it is a literal translation of Roger of Parma, see J H Aveling, "An account of the earliest English work on midwifery and the diseases of women," *Obstet J Great Britain Ireland*, 1874, *2* 73, and the severe review by Faye M. Getz in *Med Hist*, 1982, *26* 353–54 The Middle English translation of Trotula states that it was written in English because it was intended for women "Because whomen of oure tonge donne bettyr rede and undyrstande thys langage than eny other and every whoman lettyrde rede hit to other unlettyrd and help hem and conceyle hem in her maledyes, withowtyn shewyng here dysese to man, i have thys drauyn and wryttyn in englysh" (Bodley, Douce 37, f lv, quoted by Rowland, p 14) The French verse translation of Trotula in Cambridge, Trinity College 0 1 20 is also addressed to women, beginning (fol 214) "Bien sachiés, femmes " It is a quite literal translation In the fifteenth century Giovanni Michele Savonarola wrote a work in the vernacular specifically for midwives, see *Il trattato ginecologico-pediatrico in volgare "Ad mulieres ferrarienses de regimine pregnantium et noviter natorum usque ad septennium,"* ed Luigi Belloni (Milan Società Italiana di ostetricia e ginecologia, 1952)

[53] Henri Denifle and Emile Chatelain, *Chartularium Universitatis Parisiensis,* 4 vols (Paris, 1889–97), 2 266 "cum nullam causam infirmitatis infirmorum per litteram vel artem medicine cognoscat", cf Kibre, "Faculty of Medicine at Paris" (note 1 above), p 8 This argument was put forward by John of Padua, surgeon to King Philip IV Male authorities were most concerned with female practitioners who posed an economic threat to the male medical establishment. Professor Michael McVaugh has kindly called to my attention the case of a Catalan woman from near Sant Cugat del Vallès who had learned from a visiting *medicus* how to examine urine, take the pulse, and give advice She swore that she sent cases of abscesses and quartan fever "ad medicos maiores " This early fourteenth-century rural nurse was permitted to continue her practice on condition that she not use charms and not give medicine See Josep Perarnau i Espelt, "Activitats i fórmules supersticioses de guarició a Catalunya en la primera meitat del segle XIV," *Arxiu de Textos Catalans Antics,* 1982, *1* 67–72

[54] *Rotuli Parliamentorum,* 6 vols [London, 1767–1777], 4 158 The ordinance against charlatanism which was enacted in response to this petition dealt with qualifications rather than gender, see *ibid,* p 130, no 11

How did treatises attributed to a female author become accepted and widely diffused texts among male physicians at the same time that those same physicians were attempting to drive women from the practice of medicine on grounds of professional incompetence? In the first place, though we have reason to think that these treatises were produced by men, the idea that they were written by a woman from Salerno was plausible. In its early years as a medical center, Salerno may be thought of as a highly favored health spa where both men and women practiced medicine (probably frequently as members of the same family) and taught it to others, making what use they could of the learning of the Greeks and Arabs. Though some of these early physicians were clerics, this educational activity was not based institutionally in a cathedral or monastic school. In the twelfth century medical licenses were granted by neither the church nor an organization of masters, but by royal officials; as a decree of Roger II in 1140 stated, "henceforth anyone who wishes to practice medicine should appear before our officials and judges, to be evaluated by their judgment" Since no clerical status was required for such licenses, it seems likely that they could be granted to women. Records still extant from the fourteenth century show that at a time when the Parisian doctors mentioned above were arguing that a woman might easily sin by killing a patient through her ministrations, women in the Kingdom of Naples received licenses occasionally. For example, in 1307 a woman with the intriguing name of "Trotta de Troya" was granted a license to practice surgery. From a perspective north of the Alps, if a woman skilled in medicine was to be found anywhere, it would most likely be in southern Italy.[55]

The frequency with which Trotula's gender was stressed by scribes and rubricators suggests that it was not only plausible that a woman should have written these treatises; more important, it was desirable. Men knew little about feminine physiology and some were intensely troubled by their ignorance. In *De secretis mulierum,* a late thirteenth- or early fourteenth-century vulgarization of questions raised by Albertus Magnus, the author deals with the most elementary anatomical questions and tells of a man who confessed to him that once after intercourse he found his abdomen covered with blood, which "frightened him greatly, and he did not know the cause." This basic sexological handbook, which makes use of information to be found in the treatises attributed to Trotula, illustrates something of the nature of medieval male curiosity about female sexuality.[56] Since male physicians did not make intimate examinations of female patients and were normally not present at childbirth, their need and desire for information must have been acute.[57] Yet a fellow male, even an older and more experienced physician, could not provide that information with authority. A great advantage of the treatises attributed to "Trotula," even though they reveal nothing that could not be found in other Salernitan works, is that they appeared to be written "from the woman's point of view." This point was made with striking force by the author of a scientific encyclopedia of the second half of the thirteenth century, *Placides et Timéo,* also known as *Les Secrés as philosophes.* The author of this curious dialogue tells us that physicians "who know nothing, derive great authority and much solid information" from Trotula, partly because she could speak of what she had "felt in herself, since she was a woman" and partly "because she was a woman, all women revealed their inner thoughts more readily to her than to any man and told her their natures."[58]

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[55] On the institutional and intellectual history of Salerno, see Paul Oskar Kristeller, "The School of Salerno," *Bull Hist Med*, 1945, *17* 138–94 [reprinted in Kristeller, *Studies in Renaissance Thought and Letters* (Rome Edizioni di storia e letteratura, 1956), pp 495–551], esp pp 146n, 148n, 164, 171–72 In "Learned Women of Early Modern Italy Humanists and University Scholars" in *Beyond Their Sex Learned Women of the European Past,* ed. Patricia H Labalme (New York. New York University Press, 1982), p 102, after questioning the existence of Trotula, Kristeller adds that "in Salerno, Naples, and the rest of Southern Italy, we do find a number of women, beginning in 1307, who received royal licenses to treat specified diseases" Michael McVaugh kindly pointed out to me the license of "Trotta de Troya" in Raffaele Calvanico, *Fonti per la Storia della Medicina e della Chirurgia per il Regno di Napoli nel periodo Angioino (a. 1273–1410)* (Naples L'Arte tip, 1962), pp 124–25

The modern reader who, like the author of *Les Secrés as philosophes,* wants to know the medical views of a medieval woman is more fortunate than the medieval public, for the works of Hildegard of Bingen have now been printed. This twelfth-century Benedictine abbess corresponded with popes, emperors, bishops and abbots, and was a candidate for sainthood in the thirteenth century. She was also the author of two works which deal with medicine in a highly personal way. Though they do not focus exclusively on "female medicine," they do deal with such subjects as sexual relations, childbirth, and prediction of the character and physical characteristics of offspring.

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[56] On *De secretis mulierum* see Lynn Thorndike, *A History of Magic and Experimental Science,* 8 vols (New York. Columbia University Press, 1923–1958), 2 739–45, 749–50 his "Further consideration of the *Experimenta, Speculum Astronomiae,* and *De Secretis Mulierum* ascribed to Albertus Magnus," *Speculum,* 1955, *30* 427–43, Brigitte Kusche, "Zur 'Secreta Mulierum' Forschung," *Janus,* 1975, *62* 103–23, and Helen Rodnite Lemay, "Some thirteenth and fourteenth century lectures on female sexuality," *Inter J Women's Studies,* 1978, *1.* 391–400. See *Alberti Magni De Secretis Mulierum* (Amsterdam, 1740), p 17 ("utrum menstruum fluat per anum aut per vulvam") and pp 104–5 for the post-coital blood, material from "Trotula" is cited as being from a "documentum" on pp 109–11

[57] In the case of Jacqueline Félicie heard at Paris in 1322 and discussed above, her lawyer argued that "it is better and more decent that a woman who is wise and trained in the art should visit a sick woman and see and inquire into the secrets of nature and her private parts than a man, who is forbidden to touch the hands, breasts, stomach, feet, etc of women," *Chart univ Paris*, 2 264 and Kibre, "Faculty of Medicine at Paris," p 11 Richardus Anglicus makes quite a point of the fact that he was not present when a patient and the attending *obstetrix* attempted to insert a pessary he had prescribed, see Karl Sudhoff, "Der 'Micrologus'–Text der 'Anatomia' Richards des Englanders," *Arch Gesch Med*, 1927, *19* 232–33

[58] Claude A. Thomasset, ed., *Placides et Timéo ou Li secrés as philosophes,* Textes Littéraires Français (Geneva Librairie Droz, 1980), pp 133–34 Though Thomasset understandably makes much of this passage, which he says reveals "à la lettre une attitude capable de bouleverser le monde médiéval" (see his *Une vision du monde à la fin du XIII^{e} siècle Commentaire du dialogue de Placides et Timéo,* Publications romanes et françaises, 161 [Geneva Librairie Droz, 1982], pp 160–61), it is likely that for the author himself these words are empty rhetoric. I can find no evidence that the author of the dialogue actually read any of the works attributed to Trotula. The passage quoted is used to support the statement that women desire intercourse more when they are pregnant than at any other time, an assertion which does not appear in any of the texts of "Trotula." Moreover, later (p 148) the author of the dialogue refers to that growth which such physicians as "Ypocras, Galien et Trotules" call *molla,* though this term itself is not used in any of the treatises attributed to Trotula.

These books were presumably intended originally for use in Hildegard's own monastery, and their circulation in the Middle Ages was always limited; today three manuscripts of the *Subtilitates* exist, and of the *Causae et curae* only one manuscript remains.[59] It is an ironic fact that the treatises attributed to "Trotula" flourished, while the *Practica* of Trota and the medical works of Hildegard remained practically unknown.

The position I have presented here is that the professionalization of medicine in the twelfth and thirteenth centuries, combined with the virtual exclusion of women from university education, prevented them from entering the best paid and most respected medical positions. Male doctors controlled medical theory, though not the day-to-day practice of women's medicine, and their gynecological literature incorporated male experience and understanding and the academic learning available to males alone. Though it appears that *Cum auctor* and *Ut de curis* first circulated anonymously and that *De ornatu* was prefaced by a prologue written by a male author, by a process which remains obscure these three texts were brought together and attributed to a female author, and once this change had occurred, no reader could know that these works were not authentic. By including in their medical compendia these treatises falsely attributed to Trota, medieval physicians thereby unwittingly excluded women even further from participation in their own medicine. Though the treatises of "Trotula" bear a woman's name, they were the central texts of the gynecological medicine practiced and taught by men.

In the Middle Ages a female medical author seemed a believable figure, though one best imagined in an exotic locale. But in the sixteenth century Wolf considered that such a woman could not have existed and in the 1920s Hiersemann created the phantasm of "Trottus" from the flourish of a pen. Mead and Mason-Hohl, however, knew in their bones that women could practice medicine and teach it to others. A fresh study of the manuscripts, especially of the Madrid *Practica,* provides evidence for the existence of an expert woman physician named Trota, but also shows, ironically, that she was not the author of the three treatises commonly attributed to her. Thus my investigation fully supports Mead and Mason-Hohl in their faith in a historical Trota, even though it rejects their imagined biography. Seen in a fuller historical context, it should come as no surprise that Trota's career was limited by the social forces of her own day, that she produced a *Practica* quite different from the treatises usually attributed to her, and that when the term “master” was applied to her as a woman, it was with a reservation, *tanquam magistra*

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[59] On Hildegard, see Thorndike, *History of Magic and Experimental Science,* 2: 124–54. Hildegard von Bingen, *Heilkunde,* trans. Heinrich Schipperges, 4th ed. (Salzburg: Otto Muller Verlag, 1981) contains corrections to Paul Kaiser's faulty Latin edition of the *Causae et curae* (Leipzig: Teubner, 1903) in its translation. Peter Dronke writes evocatively of Hildegard's life and thought and cites the most recent literature in *Women Writers of the Middle Ages: A Critical Study of Texts from Perpetua* (†*203*) *to Marguerite Porete* (†*1310*) (Cambridge: Cambridge University Press, 1984), pp. 144–201, but a fully satisfactory study of Hildegard's views on sexuality remains to be written. In his translation and discussion of a passage crucial for understanding Hildegard's treatment of intercourse, Dronke mistakes the closing of the womb over the seed which it has just received for contractions which accompany the sexual act before its climax, see *ibid.*, pp. 175–76.

APPENDIX: ORIGINAL PROLOGUE TO *DE ORNATU*

Ut ait Ypocras in libro quem de scientia pronosticorum edidit, “omnis qui medicine artis studio seu gloriam seu delectabilem amicorum copiam consequi desiderat, rationem suam regulis prudentium adeo munire studeat,”[1] ne in singulis ad artem medendi spectantibus inermis reperiatur et rudis. Quod si facere neglexerit, loco glorie et fame dedecus et infamiam, loco amicorum quamplures sibi acquirat inimicos Sic etiam efficietur, ut a quibus in foro salutari debet et medicus appellari, eis ridiculum fiat in publico, et neque ab eis medicus appelletur. Huius intuitu rationis, ego his regulis mulierum quas in artificiali decore faciendo sapientes inueni, meam adeo in tantum muniui rationem, ut in singulis ad ornamentum faciei et aliorum membrorum muliebrium doctus reperiar Ita ut cuilibet mulieri nobili uel gregarie de huius artificio aliquid a me querenti, iuxta suam qualitatem et modum conueniens sciam adhibere consilium, ut et ego etiam laudem et ipsa optatum consequi ualeat effectum Sed quoniam, ut ait Persius, “scire meum nichil est, nisi me scire hoc sciat alter,”[2] ideo, hoc exemplo motus, uolo que de hoc artificio noui et efficaci opere probaui, litteris commendare et in compendiosum scriptum redigere. Quo mediante, quod in mente habeo in aliorum ueniat usum et iuuamen

1 ait *PL* dicit *OS*, *post* libro *add* suo *S*, edidit *om* *S* 2 seu^{1} *om.* *S* 3 rationem studeat *om* *O*, prudencium *L* prudentum *PS*, *post* prudentium *add* etiam *L*; *post* adeo *add.* se *P* 4 inermis . si *POL* ne rudis reperiatur et si rudis hoc *S* 5 et fame *om* *S*; quamplures *POL* plures *S* 6 etiam *PO* quod *L* *om* *S*, debet *OLS* deberet *P* 7–8 eius ridiculum fiet … appelatur *S* appeletur *scripsi*; eis fiat r in publico *L*, eis fiat r in populo et plebis abittio *P*, eis fiat r in populo et plebis abiectio *O* 8 Huius *OS* hoc *PL*, his regulis *POL* uolens aliquas experiencias *S* 9 sapientes *POL* facetas *S*, adeo *om* *S*; in tantum *om* *LS*, *post* singulis *add* tam *S* 10 ornamentum *POL* ornatum *S*; et aliorum *L* quam ceterorum *S*; faciei … membrorum *om.* *PO*; muliebrium *POL* mulierum *S*, reperiar *POL* reperiatur *S*, Ita *S* Ista *L* *om* *PO* 11 ut *PO* *om.* *S*; cuilibet *POL* cuiuslibet *S*, uel huius *POL* seu gentili et de eius *S*; a me *om* *O* 12 suam *S* sui *POL*, sciam *POL* suum *S*; et^{2} *om* *S* 13 etiam *L* *om* *POS*, ipsa *OLS* ipsam *P*, optatum *POL* exoptatum *S*; ualeat *POL* ualet *S*; Sed POL Sit *S* 14 Persius *POL* Proferius *S*; meum *POL* teum *S*, me *POL* *om.* *S*; hoc^{1} *OL* meum *P* tuum *S*, alter *PO* alterum *L* aliter *S* 14–15 ideo .. motus *POL* *om* *S* 15 que *POL* itaque *S*, et .. probaui *PO* *om* *LS* 16 Quo *S* Quod *POL*, in^{2} *om* *O* 17 *post* habeo *add.* et *S*, usum et iuuamen *PO* usum *L* notitiam *S*

[N B . Differences of word order are not indicated]

Paris, B N lat 16089, fol 113 (c 1250) = *P*, Oxford, Exeter College 35, fol 227v (XIV^{1}) = *O*, London, B L Harley 3542, fol 97v (XV^{1}) = *L*, and Salzburg, Museum Carolino-Augusteum 2171, fol 180 (XV med.) = *S*

[1] *Prognostica,* trans attributed to Constantine the African, preface, printed in *Articella* (Venice, 1492), fol 40

[2] *Sat.* 1 27 scire tuum nihil est nisi te scire hoc sciat alter

BACTERIAL PHYSIOLOGY: THE MEDICAL CONTEXT*

Robert E. Kohler

The growth of interest in bacterial physiology and biochemistry is an important, though little studied trend in the history of twentieth-century medicine. A survey of the scientific literature suggests that this new field did not develop uniformly in departments of medical bacteriology. Rather it emerged in a few scattered institutions from 1910 on, and in diverse disciplinary contexts: biochemistry, biology, brewing, and agriculture, as well as medical bacteriology. By the 1940s it had become sufficiently familiar to be introduced almost anywhere. In the preceding two decades, however, sustained innovation in bacterial physiology depended on incentives and resources available only in special local contexts.

Such changes in science are inherently collective or community phenomena. Variations in scientific thought and practice occur continuously and randomly; most remain the property of individuals, but in favorable institutional contexts, a few grow to become schools or specialties. Charles Rosenberg has suggested that innovations be approached as problems in the "ecology of knowledge": the idea of variation and adaptation is quite explicit. Rosenberg and others, including myself, have also emphasized the critical role of disciplines as sources both of variation and of selective forces.[1] The intellectual traditions, professional reward systems, and service roles of disciplines and professions afford systematic opportunities for innovation, but organizational structures and habits also impose limits on change. We must look first, in a general way, at the incentives and constraints in particular disciplines, then understand in detail how particular institutional contexts enabled a few individuals to exploit those incentives and escape the usual limits on innovation.

In another paper, I describe the emergence of bacterial physiology within the discipline of biochemistry, focusing on Marjory Stephenson's work

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[1] Charles E Rosenberg, "Toward an Ecology of Knowledge On Discipline, Context, and History," in Alexandra Oleson and John Voss, eds, *The Organization of Knowledge in Modern America, 1860–1920* (Baltimore The Johns Hopkins University Press, 1979), pp 440–55, Robert E Kohler, *From Medical Chemistry to Biochemistry The Making of a Biomedical Discipline* (Cambridge and New York. Cambridge University Press, 1983)

Bull Hist Med, 1985, *59*· 54–74

on bacterial enzymes and metabolism between 1920 and 1940 at Cambridge University. I argue that the traditions of biochemistry offered some incentives for studying the diverse chemical activities of bacteria, but that these same traditions made it unlikely that chemists would study bacteria for their own sake, as organisms with distinctive physiologies. F. Gowland Hopkins's school at Cambridge was an exception to this rule. Hopkins conceived biochemistry as a broadly biological discipline, and his comparative approach to chemical physiology created a niche for Marjory Stephenson to develop bacterial physiology from a vague idea to a new research field.[2] A special institutional context thus provided a rationale, resources, new service roles, and protection from established research traditions that tended to force marginal research interests into more orthodox forms.

A similar pattern of local innovation also occurred in medical bacteriology in Britain. Disciplinary structures and research traditions in bacteriology provided some opportunities in bacterial physiology, but also set limits on the ability of medical bacteriologists to pursue such studies for their own inherent interest. The principal service role of most medical bacteriologists in hospitals and medical schools in the early twentieth century was to isolate pathogenic organisms, characterize them simply and unambiguously, and discover appropriate therapeutic measures. Morphology and staining were the most important taxonomic criteria until about 1900. Nutritional requirements then became increasingly important for differential diagnosis, as did serological typing after World War I. The principal locus for such work was the hospital diagnostic laboratory, which became an indispensable part of hospitals and medical schools in the early 1900s. Diagnostic testing was a major source of external support for bacteriological research at that time, providing problems, jobs, and access to interesting clinical material.

Diagnostic and therapeutic routines afforded chances for bacteriologists to encounter problems in bacterial physiology. For example, a frequent problem in isolating pathogens was to find an artificial culture medium on which they would grow in vitro. That was often a challenging task, since pathogenic species often have complex requirements for growth. Similarly, improvements in differential diagnosis required systematic chemical surveys of factors required for growth. Thus medical bacteriologists' daily routines systematically exposed them to aspects of bacterial metabolism and physiology Finally, there was always the hope that knowledge of the physiology of infection and resistance would make it possible to design specific chemical therapeutics. The physiology of the host-parasite relation was thus an object of continuing, though sporadic, interest among medical bacteriologists.

At the same time, their service roles strictly limited how far medical bacteriologists could actually pursue a nascent curiosity about bacterial physiology as such. The increasing burden of routine diagnosis in hospital laboratories in the decade after 1910 left less time for pursuing purely scientific interests. Rewards tended to go for discoveries of new pathogens or improved media and diagnostic procedures, not for controversial ideas about bacterial physiology. The practical requirements of diagnostic routines may have inhibited more searching investigation of some interesting physiological problems, like variability of morphology and nutrition; adaptation—the ability of some bacteria to change their metabolic machinery in response to new nutrients; or attenuation of virulence and the variable nature of host resistance. For practical bacteriologists these phenomena were more a nuisance than an opportunity; pitfalls to be avoided, not interesting problems to be pursued. Careers depended on having consistent and predictable diagnostic procedures, the unexpected was a threat. So too with therapeutics: it made more sense to search for "magic bullets" like salvarsan, than to acquire slowly and laboriously a deep understanding of the physiology of the infection process The mysterious variability of resistance to infection was more an impediment than an inducement to research.

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[2] Robert E Kohler, "Innovation in normal science· bacterial physiology," *Isis* (in press), Muriel Robertson, "Marjory Stephenson, 1885–1948," *Obit Notices Fellows Roy Soc*, 1949, *6* 563–77

Disciplinary incentives and ideals may also have inhibited interest in bacterial physiology by encouraging large investments of time and energy in serological typing and virology These extensions of classical bacteriological techniques were extremely important for clinical practice, and they were popular, rapidly growing fields in the 1920s and 1930s. In contrast, bacterial physiology and nutrition were marginal and occasional activities in these decades. Interest rose and fell with scientific fashion There was a burst of interest in bacterial nutrition in the early 1920s, for example, which reflected the postwar enthusiasm about vitamins, and the hope that bacterial systems might yield discoveries more cheaply and quickly than animal experiments. As these hopes were not realized, interest waned The number of citations to such work in Bert Knight's 1936 monograph, *Bacterial Nutrition,* shows a sharp rise in 1920–22 followed by a plateau or decline until the mid-1930s.[3] The literature was widely scattered, and much was incidental to more orthodox research programs The distribution of the Medical Research Council's grants for chemical microbiology shows the same pattern, and a marked tendency for mixed projects in chemical bacteriology to revert to mainstream bacteriology.[4] Paul Fildes's program at the London and (after 1934) Middlesex Hospital was the only one of over a dozen initiatives in bacteriology to result in a permanent research effort in bacterial physiology.

In the case of the Cambridge school of biochemistry, three factors were vital to the development of bacterial physiology. an unusual programmatic vision, outside patronage by the Medical Research Council (MRC), and positive feedback from investment in new laboratory skills and routines. Similar patterns can also be seen in Paul Fildes's career. He spent his formative years among a group of self-conscious medical reformers, insulated from the usual attractions of medical bacteriology, and exposed to novel ideas about bacterial physiology peculiar to the London Hospital group. The Medical Research Council provided resources not available from (and not controlled by) the Hospital Medical School. Positive feedback from new laboratory methods was especially important. As the leader of a multi-disciplinary research team, Fildes was deeply influenced by his collaborators, most of whom were chemists. Biochemical methods also produced the volume and kind of results that justified an expensive, full-time research team. In Fildes's case, as in Stephenson's, innovation depended on special local conditions during a time when new lines of work could not have been sustained by the usual disciplinary reward systems.

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[3] Bert C J G Knight, *Bacterial Nutrition* (London HM Stationery Office, 1938) According to Fildes, this monograph was in fact published in 1936

[4] Kohler, "Innovation in normal science," fig 1

Fildes's Early Work—The 1920s. As a young man, Paul Fildes was not adventurous in his research interests, relying mainly on his mentors' ideas However, an iconoclastic personal style was evident from his earliest years. He did poorly in his premedical studies at Cambridge, most likely because he did not care to do well. He made no effort to impress his director of studies, Walter Fletcher, and the physiologist Joseph Barcroft later admitted (on the occasion of Fildes's election to the Royal Society) that he had thought him a "bloody fool."[5] Fildes entered the London Hospital Medical School in 1904 as a protégé of the chief of surgery, Sir Frederick Treves, his family's medical advisor and a client of his father, a fashionable portraitist. Yet Fildes distanced himself from the London medical elite just as he had from the academic elite. On being medically qualified in 1909 he scandalized his patrons by declining appointment to the clinical staff and taking a position as a virtually unpaid assistant to the pathologist William Bulloch.[6]

In joining Bulloch, Fildes cast his lot with the reformers agitating for more science in medical education. The conflict between traditional clinicians and medical scientists was then at its highest pitch in the London hospitals. Clinicians had traditionally taught the preclinical sciences and bitterly resented being pushed aside by professional scientists. They resisted most successfully where academic traditions were weakest—at the London Hospital, for example. The first appointments of medical scientists were made there in the late 1890s: Arthur Keith in anatomy, Leonard Hill in physiology, William Bulloch in pathology, and James McIntosh in bacteriology. They enjoyed little peace. Bulloch had especially stormy relations with the clinical staff, owing to his critical, uncompromising style, and his habit of plain speaking. In 1909 the clinical pathologists created a rival department at the hospital and monopolized routine laboratory testing, thus cutting Bulloch's group off from access to clinical material. Bulloch retreated to three uncomfortable rooms on the top floor: "In this unprepossessing part of the Medical College Bulloch remained for 40 years, sitting at a desk in the draft of an open door in the most inconvenient room. On the door were the words 'This is my busy day.' "[7] Ostentatious isolation had a price: by 1906 Bulloch had abandoned laboratory research for teaching and literary work. Fildes thus spent his formative years as the protégé of an increasingly isolated prophet of biomedical science, in a state of perpetual siege by a conservative clinical staff. Like Bulloch he found the role of gadfly and prophet quite agreeable.

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[5] Gareth P Gladstone, Bert C J G Knight, Graham Wilson, "Paul Gordon Fildes, 1882–1971," *Biog Mem Fellows Roy Soc*, 1973, *19* 317–47 See especially pp 318, 340–41

[6] *Ibid*, pp 320–21

Fildes's researches from 1909 to 1914 closely followed the interests of his mentors, particularly James McIntosh. One of the new men in experimental pathology, McIntosh had worked at the Pasteur Institute in Paris with Elie Metchnikoff, Constantin Levaditi, and August Wassermann. He was a personal friend of Paul Ehrlich, who sent him some of the first trial samples of salvarsan for testing. As pioneers of the new syphilis chemotherapy in Britain, McIntosh and Fildes were continually embroiled in controversy. Clinicians at the London Hospital resented their laboratory colleagues' control of the clinical trials, and were furious when McIntosh refused to release salvarsan for treatment of their private patients. Some attacked the use of the drug as ineffective and unsafe.[8] Fildes's twenty-seven papers published between 1909 and 1915 included twenty on syphilis. They reveal an active, ambitious clinical scientist, working on the fringes of the new Continental experimental pathology. It was not exactly "classical" medical bacteriology, but there is no hint as yet of Fildes's later biochemical interests. His mentors may have seemed radical in their milieu, but they were by no means a biological or biochemical avant garde.[9]

War in 1914 brought Fildes greater independence and a wider range of problems. Characteristically, he declined to be a Fleet Surgeon, an appointment to which a man of his status was entitled, and accepted a less prestigious but more independent position as a chief of a laboratory in the Haslar Naval Hospital[10] The trauma of total warfare produced urgent problems for bacteriological research. Syphilis, tuberculosis, diarrhea, meningitis, gas gangrene, and tetanus appeared on an epidemic scale in the trenches. Anaerobes that infected deep wounds were especially important and interesting problems. Fildes developed new methods for cultivating tetanus bacilli and clostridia in vitro (both are extremely sensitive to air), and in 1917 published a book on the classification of these exacting organisms.[11]

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[7] *Ibid*, pp 319–20, Paul Fildes, "William Bulloch, 1868–1941," *J Path Bact*, 1941, *53* 297–308

[8] Gladstone et al, "Fildes," pp 321–25

[9] The *British Journal of Experimental Pathology*, which McIntosh and Fildes helped found in 1920, represents this style of conservative innovation

[10] Gladstone et al, "Fildes," p 326 Fildes also crossed swords with the doven of British immunology, Sir Almroth Wright, who believed that antiseptics were useless

[11] *Ibid*, pp 325–28, James McIntosh and Paul Fildes, *The Classification and Study of the Anaerobic Bacteria of War Wounds*, MRC Report no 12 (London H M Stationery Office, 1917)

The war also gave Fildes important contacts with the Medical Research Council, which organized and supported medical research during and after the war. As Secretary of the MRC, Walter Fletcher gave individuals like McIntosh and Fildes every opportunity to show that experimental physiology and pathology paid dividends in the long term. Support for basic biomedical research was almost lavish, and the MRC connection remained vital for experimental pathologists after the war

Fildes returned to the London Hospital in 1919 to a position as half-time "external" research staff of the MRC. There he pursued new lines of research stemming from his varied war experience.[12] His first project grew out of the influenza pandemic of 1918–19. While most bacteriologists believed that influenza was a viral disease, Fildes and McIntosh championed the older view that *Bacillus influenzae* was the infectious agent. Widespread uncritical acceptance of the viral theory indicated to them that it was a mere fashion, and they argued that practical ambiguities undercut all arguments against a bacterial etiology for influenza.[13] Fildes's quixotic defense of the true bacteriological faith effectively cut him off from the rapidly developing field of virology, which was then attracting many of the best "classical" bacteriologists.[14] Rejecting the new mainstream, Fildes was free to develop older, less fashionable byways of bacterial physiology.

These concerns began to surface in Fildes's last three papers on *Bacillus influenzae* in 1921–24, which dealt with nutritional requirements and their physiological and taxonomic meaning. Here too, Fildes took a controversial (and losing) position on a hotly disputed issue. *B influenzae* required two factors for growth in vitro: one was *haemin,* which all hemolytic bacteria require; a second factor, "V," was special to *B. influenzae.* The American bacteriologist, Oswald Avery, put all hemolytic bacteria in a new genus, *Hemophilus,* Fildes believed that *B. influenzae* constituted a distinct group.[15] Their disagreement reveals an important feature of Fildes's biological outlook. Avery saw nutritional requirements as fixed species characters; Fildes saw nutritional requirements as clues to dynamic phylogenetic relationships. He reasoned that *B influenzae* was a rare primitive species, from which other hemolytic species had evolved, in the process gradually acquiring the ability to synthesize factor "V."[16] Fildes lost the argument with Avery, but his physiological, phylogenetic habit of thought proved to be a rich source of innovative ideas.

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[12] Fildes, reports to the MRC, 15 July 1921, 14 Aug 1924, 8 Sept. 1927, File 1300, MRC Archives (henceforth abbreviated as MRC 1300)

[13] Paul Fildes and James McIntosh, "Aetiology of influenza," *Brit J Exp Path*, 1920, *1* 116–29, 159–74

[14] A. Landsborough Thomson, *Half a Century of Medical Research*, Vol I, *Origins and Policy of the MRC (UK)* (London H M Stationery Office, 1973), pp 111–17

[15] Theodor Thjotte and Oswald T Avery, "Studies in bacterial nutrition III," *J Exp Med*, 1921, *34* 455–66

[16] Paul Fildes, "The classification of haemoglobinophilic bacteria, based on their relation to blood-pigment and to the 'vitamine' factor," *Brit J Exp Path*, 1923, *4* 265–71, Paul Fildes, "The growth requirements of haemolytic influenza bacilli and the bearing of these upon the classification of related organisms," *Brit J Exp Path*, 1924, *5* 69–74

Fildes's famous work on tetanus in 1925–28 also developed from traditional bacteriology to a more physiological mode. This project resulted from Fildes's wartime work on anaerobes For technical reasons, he and others had never found a method of isolating pure strains of bacteria from the mixed flora of deep wounds. In 1924, however, Fildes chanced to observe that *Bacillus tetani* grew in long filaments on agar, and he realized that this peculiarity might enable him to isolate pure strains from the fringes of mixed cultures. It did, and Fildes was quick to exploit the opportunity. In a short time he had isolated seventy-five strains of *B. tetani*, grouped them serologically, and characterized their morphology and nutritional requirements It was "classical" medical bacteriology, and it made Fildes's reputation among medical bacteriologists.[17] However he may have differed from conservative diagnosticians, Fildes still looked to his professional community for legitimation of his work, just as Marjory Stephenson never hesitated to exploit opportunities in "classical" biochemistry when they came her way.[18] At the same time, however, Fildes was drawn into exploratory forays in bacterial physiology, as Stephenson had been. These ventures beyond the familiar rules and rewards of medical bacteriology were opportunistic, but the opportunities were in part created by Fildes's theoretical expectations.

Fildes's novel ideas begin to be evident in his later (1927–29) papers on *B. tetani*, in which he took up the problem of spore germination. Germination of spores in vivo is notoriously unpredictable, and all of the theories put forward were controversial. It was well known that germination was facilitated by injection of salts, soil, or mechanical irritants together with spores. The most widely held explanation of this phenomenon of "defense rupture" was that irritants stimulated phagocytes, which engulfed spores and in so doing provided favorable conditions for germination. Fildes showed, however, that there was no correlation between germination and phagocytosis, and suggested instead that spores were inhibited from germinating by traces of oxygen. The effect of dirt, he supposed, was to set up a putrefaction and necrosis, which restricted access to oxygen and created highly reducing environments conducive to germination and growth of *B tetani*.[19]

To prove his biochemical theory, Fildes measured the reduction potential of *B. tetani* cultures, using a technique developed by physical chemist William Mansfield Clark. Clark employed indicator dyes as oxidation-reduction buffer systems, the potentials of which could be standardized and correlated with bacterial growth rates. Fildes demonstrated that there was in fact a threshold reduction potential, above which *B. tetani* spores could not germinate.[20]

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[17] Paul Fildes, "Isolation, morphology and cultural reactions of *B tetani*," *Brit J Exp Path*, 1925, *6* 62–70; Gladstone et al, "Fildes," pp 329–30

[18] Kohler, "Innovation in normal science"

[19] Paul Fildes, "The conditions under which tetanus spores germinate *in vivo*," *Brit J Exp Path*, 1927, *8* 387–93, Patrick Laidlaw to A L Thomson, 27 Feb 1929, MRC 1300

[20] Paul Fildes, "The positive limit of oxidation-reduction potential required for the germination of spores of *B tetani in vitro*," *Brit J Exp Path*, 1929, *10* 151–75

Fildes had no problem learning about this chemical technique. Although Clark himself wrote as a sophisticated physical chemist, his method had been developed in the U.S. Public Health Service's Hygienic Laboratory for use by bacteriologists. It had been employed as early as 1919–20 by bacteriologists at the MRC's National Institute for Medical Research in London.[21] Moreover, Clark's protégé, R. Keith Cannan, was a postdoctoral fellow at University College, and Fildes was able to benefit from his advice and expertise. This contact proved important as Fildes began to improve upon his initial, rather inelegant experiments.

Fildes naturally wanted to increase the return from his investment in a new laboratory skill, and made plans to measure threshold potentials for germination of other anaerobic bacteria.[22] Clark's dye method proved to be too laborious for widespread use. A serious problem was the difficulty of keeping the potential of a culture medium constant for a long enough period of time to detect long lags in germination; values of threshold potentials measured by this method were thus likely to be too high. The ideal solution was to use the glass electrode, which indicated reduction potential directly and accurately. But the glass electrode was a new laboratory technology, requiring a high level of chemical skill and knowledge, which Fildes lacked. He needed a chemist, and Cannan directed him to Bert Knight, a young physical chemist at University College who was about to take (reluctantly) an industrial job. Fildes applied to the MRC for funds, and in March 1929 a grant for Knight to do research was approved.[23]

The partnership was an instant success. Knight dropped the cumbersome dye method and adapted the glass electrode to work with bacterial cultures. He also invented an ingenious system for holding the reduction potential constant for long periods of time, using traces of oxygen present as an impurity in commerical nitrogen. With this apparatus, Knight and Fildes were able to get precise values of the limiting potential for germination of *B tetani* in vitro.[24] Fildes also did preliminary experiments on the germination of spores in vivo, using injections of varying amounts of oxygen and dyes into experimental animals.[25] These were his last papers on the physiology of germination and infection, however. He and Knight abruptly abandoned their new technique in 1930, with the survey of anaerobic species scarcely begun.

What happened, it seems, was in part an unintended consequence of the new laboratory technique. The glass electrode was accurate and convenient for work in vitro, but useless in vivo. Having adopted chemists' standards of accuracy and elegant technique, Fildes could hardly revert to the inexact and inelegant methods of experimental pathology. Moreover, technical difficulties encountered in growing pathogens in vitro were becoming interesting problems in themselves. Precise measurement of the effect of reduction potentials on growth rates required that organisms be grown in well-defined, standardized media.[26] However, most pathogens only grow on complex media containing chemically ill-defined tissue fluids. Since little was known of the nutritional requirements of the medically interesting anaerobes, Fildes and Knight were obliged to do the work themselves as a preliminary to investigation of potentials and growth. This proved to be a bigger task than they had expected, and also a much more interesting one. By 1933 they were working full time on bacterial nutrition. What had begun as routine preliminary to a study of germination had become a complete program of research in bacterial physiology.[27] The biochemical tail had begun to wag the bacteriological dog.

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[21] John W H Eyre, *The Reaction of Media* (London HM Stationery Office, 1919), Frederick F Russell to William M Clark, 14 Jan 1920, William M Clark Papers, American Philosophical Society Library, Philadelphia

[22] Patrick P Laidlaw to A.L Thomson, 27 Feb 1929, MRC 1300

[23] Fildes to Walter M Fletcher, 14 Feb 1929, A.L. Thomson to Fildes, 20 Feb and 20 Mar 1929, Fildes to Fletcher, 27 Jan. 1931, MRC 1300 Bulloch had entertained (but rejected) this same idea in 1912, in connection with the growth of clostridium in wounds

[24] Bert C J G Knight, "Oxidation-reduction studies in relation to bacterial growth," *Biochem J*, 1930, *24* 1068–74, 1075–79, Knight and Fildes, "The positive limit of oxidation-reduction potential required for the germination of *B tetanus* spores *in vitro*," *ibid*, 1496–1502

[25] Fildes and J Argyl Campbell, "Tetanus X the effect of the oxygen tension on the tissue fluids in controlling infection by *B tetani*," *Brit J Exp Path*, 1931, *12* 77–81

What was behind Fildes's shift from "classical" bacteriology to the messy world of bacterial nutrition? Context was probably important; but we know little about Bulloch's group of self-styled mavericks. They were not active in research in the 1920s, and were not at all given to programmatic statements. There are hints, however, that Fildes's colleagues stimulated his interest in bacterial physiology. His membership in Bulloch's group protected him from the temptations of fashionable clinical pathology, and his commitment to the ideology of medical reform was an incentive to demonstrate the usefulness of the ideas and methods of biology and chemistry. That connection compensated for limited support from the hospital physicians, providing novel intellectual resources and the motivation to persist in an unorthodox line of work. Practical opportunity was also important. Fildes made no single deliberate decision to innovate, or to become a hybrid; he was led gradually into biochemistry. Investment in new laboratory technologies, an expert biochemist as partner, appreciation by a constituency of biochemists, recognition of opportunities in a fashionable discipline—all these drew Fildes on to become, in part, a biochemist. But opportunities are created by being recognized, and recognition depends on expectations that precede evidence. At each step, Fildes's choices were guided by his belief that chemistry was vital for progress and reform in pathology and medicine. That belief preceded and revealed the "logic" of results from laboratory practice.

Bacterial Nutrition—The 1930s Bacterial nutrition was rapidly reviving as a competitive research area in the early 1930s, after a decade of stasis.[28]

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[26] Fildes, report to the MRC, 1 Nov 1933, MRC 1300

[27] Fildes, reports to the MRC, 3 Nov 1931, 1 Nov 1932, 27 Sept. 1933, MRC 1300

[28] These trends are evident in the distribution of literature citations in Knight, *Bacterial Nutrition* Citations per year increased rapidly in 1919–21, leveled off and fluctuated irregularly in 1921–29, then increased rapidly after 1931

Fildes and Knight took a consciously entrepreneurial part in this revival. Their papers are programmatic in style, at once proprietary and critical of the earlier literature. Laying claim to discovering the first true bacterial vitamin in 1933, they compared it to plant growth hormones, thus staking out a broad field of work in comparative physiology.[29] Knight's 1936 monograph systematized the scattered literature on bacterial nutrition for future workers, as Marjory Stephenson's 1930 book had for bacterial physiology. Knight also laid out Fildes's phylogenetic theory of "essential metabolites," clearly intending that it be adopted as the theoretical basis for future work in the field. (See below.) By developing standardized experimental routines and doing systematic surveys of bacterial species, Fildes and Knight positioned themselves at the center of the new field of bacterial nutrition.

To carry out their ambitious program, however, Fildes and Knight required organization and resources. The field of bacterial nutrition was accessible and increasingly competitive. It was relatively cheap, required no elaborate or special skills, and promised large payoffs. The best strategy for staying in the lead was to publish more and faster than others did, and that required an efficient research team and steady financial support. Fildes had already begun to build such a team, using grants from a variety of sources, but support was scattered and unpredictable. He himself had been on half-time salary from the MRC since World War I, and Knight was supported by annual MRC grants. The chemist Maxwell Richardson had joined them in 1932 on a grant from the Department of Scientific and Industrial Research, and Gareth P. Gladstone was working gratis as a candidate for the diploma in bacteriology.

In April 1933 Fildes broached to the MRC the idea of a permanent research team with long term funding:

> I have had the idea for years that a new outlet would be provided for medical bacteriology if the methods used and knowledge gained by the non-medical bacteriologists were adopted. This entails the attraction of chemists to collaboration with medical bacteriologists . . . My idea is to form a central laboratory where two bacteriologists, two chemists, and assistants, would work together as a nucleus and where temporary research fellows could be received.[30]

As a member of the MRC's Bacteriological Committee, Fildes lobbied the MRC to make a major commitment to bacterial chemistry.

Fildes had a willing ally in the MRC's secretary, Walter Fletcher. Since 1918, Fletcher had been trying to get biochemists and bacteriologists to cooperate, but with less than full success.[31] Recent collaborative projects at the London School of Hygiene and University College were more chemical than medical, and not under MRC influence.[32] Fletcher also felt that the time had come for the MRC to convert annual grants into five-year block grants in support of permanent research units[33] Two such units, in malaria and neurology, had just been organized, and Fildes's proposal seemed to Fletcher the perfect chance to create a third, in bacterial chemistry.[34] Fletcher's strong endorsement of Fildes's scheme assured that it would be approved.[35]

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[29] Fildes and Knight, "A vitamin necessary for the growth of *B. Sporogenes*: its relation to auxin and other growth factors," *Brit. J. Exp. Path.*, 1933, *14*: 112–24.

[30] Fildes memorandum, quoted by Gladstone et al., "Fildes," p. 332. The document from which the quote is taken is probably the report of 26 April 1933 mentioned in the minutes of the MRC Bacteriology Committee, but missing in the files, MRC 1300/1.

[31] Kohler, "Innovation in normal science."

The impediments to Fildes's plan were space and money. The problems at the London Hospital were intractable. Bulloch's department was ill-equipped and isolated from the hospital. Fildes had to run down three floors to use the hospital's centrifuge, and was refused access to clinical material by the hospital pathologists. Fletcher had long deplored this situation, but until Bulloch retired could do nothing about it. Fildes had to move, but where? Fletcher suggested he set up his laboratory in Cambridge, but Fildes refused to leave London, and the National Institute for Medical Research had no room for him[36] The Middlesex Hospital was more promising. James McIntosh had become head of the Institute of Pathology there, which included an active group of clinical chemists under Edward C. Dodds. Both McIntosh and Dodds were eager to receive the new unit and promised to cooperate in every way.[37]

Money was a more difficult problem. Fildes and Knight envisioned a group of six permanent researchers: themselves, a second biochemist, a bacteriologist, and two assistants. They also expected the MRC to come up with £1500 of new money. Fletcher's policy was that permanent projects of this sort should be partly funded by private means, and though he was willing to help raise the extra money, he made it clear that the MRC would not foot the bill alone. Fildes proposed to make an appeal to the Leverhulme Trust for assistants' salaries, but Fletcher vetoed that, hoping that an appeal by the MRC might get support for the whole unit.[38]

Fletcher did not live to see his plan through. He died suddenly in June 1933 from a fulminating abscess in an old wound. His assistant, A. Landsborough Thomson, appealed to Viscount Leverhulme, but the Trust was only interested in providing graduate fellowships, and declined to support a research unit.[39] For four months nothing more was done. In November, Fletcher's successor, Edward Mellanby, received a promise of a five-year fellowship for Knight from the Halley Stewart Trust.[40] But £1000 was still needed to finance the proposed unit. In December 1933 Mellanby urged Fildes to reduce the size of his team Fildes refused and the meeting ended on a note of discord, with Mellanby complaining that Fildes "seemed quite incapable of taking a large view of the situation, all his thought and all his language seemed to be directed towards his own personal work and future."[41]

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[32] Walter Fletcher, "Researches in Bacterial Chemistry," 19 May 1933, MRC 1300/1 Harold Raistrick and William W C Topley were at the London School of Hygiene, Charles Harington and Arthur E Bovcott, at University College London

[33] Fletcher to F Gowland Hopkins, 20 Nov 1928, MRC PF 106

[34] Thomson, *Half a Century,* 1 133–41, 2(1975) 352–69 These units were modeled on the MRC's Department of Clinical Research created in 1919 at University College Hospital

[35] Minutes of the Bacteriological Committee, 26 Apr and 26 May 1933, Fletcher, "Researches in Bacterial Chemistry," 19 May 1933, MRC 1300/1

[36] Fletcher memorandum (Knight), 23 Mar 1933, MRC 1300, Thomson memorandum (Fildes), 5 May 1933, Fletcher, "Researches," 19 May 1933, MRC 1300/1

[37] Minutes of Bacteriological Committee, 26 May 1933, Thomson memorandum (Fildes), 5 May 1933, Edward C Dodds to Fletcher, 9 May 1933, MRC 1300/1

[38] Fletcher, "Researches," 19 May 1933; Thomson memorandum (Fildes), 5 May 1933, MRC 1300/1

[39] Thomson to Viscount Leverhulme, 5 July 1933, Leverhulme to Thomson, 14 July 1933, MRC 1300/1

This chilly confrontation reveals a basic difference in organizational purposes Mellanby aimed to create a community of bacteriological chemists, and he therefore expected Fildes to have a small permanent staff and rely on temporary research trainees. For both Fletcher and Mellanby, the MRC's mission was to organize a national system of institutions for recruiting, training, and employing medical researchers.[42] They saw research units as demonstration centers for the development of research communities in neglected areas between disciplines and between basic science and clinical fields.

Fildes was less interested in training bacterial chemists than in producing high quality research efficiently, fast, and on a large scale His ability to compete depended on productivity, and productivity required a large permanent team, which would work together efficiently under his direction. Temporary fellows would need perpetually to be trained on the job, and would thus interfere with the production of research. Not being a university teacher, Fildes was insensitive to the MRC's mission of developing communities of scientists In this he differed somewhat from Marjory Stephenson. She did not always like having temporary research fellows coming and going but made the best of it because she saw the necessity of getting a flow of recruits to bacterial physiology

Fildes broke the deadlock, making use of a family connection. Shortly after his frustrating interview with Mellanby, he gave his proposal to his brother, who was the Secretary of Lever Brothers Inc. The elder Fildes presented the plan to the Leverhulme Trustees, who quickly agreed to give the requested £1000 per year for five years.[43] Money in hand calmed differences in organizational philosophy. The Research Unit in Bacterial Chemistry was established at the Middlesex Hospital in 1934. In 1938, both the Leverhulme and Halley Stewart Trustees renewed their grants for another five years.[44]

Fildes's group quickly became a leading center of research in bacterial nutrition. The experimental routine was simple: suspected essential metabolites were added one by one to non-growing suspensions of bacteria in minimal media. Resumed cell division indicated that an added compound was a nutritional requirement. Such routines were ideal for a permanent research team: once established, they could be applied to one group of bacteria after another, and interesting and novel results were bound to turn up. They did. Fildes's group published forty-seven papers between 1933 and 1941, thirty-four on bacterial nutrition His team identified many nutritional requirements, and showed that animal vitamins, thiamin, nicotinamide, and pantothenic acid, were also vitamins needed by bacteria.[45] There was not the variety of problems studied that was characteristic of Stephenson's group, with its informal structure and varied academic connections. Fildes was not obliged to cater to individual interests. He pursued one problem relentlessly, and the steady output of results enabled him to make his mark in a highly competitive field.

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[40] E Mellanby to Sir Halley Stewart, 17 Nov, 8 and 21 Dec 1933, Mellanby memorandum (Dr Bernard H Stewart), 23 Nov 1933, MRC 1300/1

[41] E Mellanby, memorandum (Fildes), 6 Dec 1933, MRC 1300/1

[42] *Ibid*

[43] M R. Miller to Fildes, 15 Jan 1934, MRC memorandum, "Research in Bacterial Chemistry," 12 Jan 1934, Mellanby to Fildes, 23 Jan 1934, Thomson memorandum (Fildes), 21 Mar 1934, MRC 1300/1

[44] M R. Miller to Fildes, 25 Feb 1938, Fildes to Mellanby, 14 Mar 1938, MRC minutes, 15 July 1938, Mellanby to Halley Stewart Trustees, 1 Nov 1938, MRC 1300/1

The organization and practice of research in Fildes's team also pushed him relentlessly away from pathology and into biochemistry. While he continued to work with *Clostridium sporogenes, B botulinus, B anthracis,* and *Streptococcus haemolyticus,* Fildes turned more and more to less virulent species like *Staphylococcus aureus, Proteus, B sporogenes, B typhosus,* and *E coli.* Boils and diarrhea lacked the appeal to pathologists of tetanus, syphilis, or botulism, but the less pathogenic organisms were easier to manipulate in the laboratory, and increasingly Fildes was interested more in biochemistry than the physiology of infection.

Fildes's changing priorities were also reflected in his choice of co-workers: half were chemists in 1934, by 1939, it was five out of six (See Figure 1.) Biochemists naturally did biochemistry. Investment in skills and routines thus deflected Fildes's program from its original aim. The group did some work on bacterial toxins, but none at all with animals or human patients. Fildes told Mellanby in 1938 that he intended to get back to pathology eventually, but he never did.[46] Vitamins, coenzymes, and metabolic pathways were big scientific news in the late 1930s, and Fildes found himself producing for an audience of biochemists

Fildes regretted his growing distance from the medical community. He saw himself as a pathologist and steadfastly preached medical bacteriology while practicing biochemistry. He criticized Marjory Stephenson for being "hopelessly out of touch" with the medical aspects of bacterial chemistry.[47] Yet his own mentor, Bulloch, thought Fildes's work was merely academic, irrelevant to clinical medicine.[48] In his presidential address to the Royal

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[45] Gladstone et al, "Fildes," pp 330–32 and papers cited.

[46] Fildes to E Mellanby, 14 Mar 1938, MRC 1300/1

[47] Fildes to A. L Thomson, 6 Dec 1934, MRC 2036/2

[48] Gladstone et al, "Fildes," p 332

Bert Knight	1929–1939	physical chemist
Gareth P Gladstone	1932–	bacteriologist
George M Richardson	1932–37, 1939–	biochemist
Hugh McIlwain	1937–40	organic chemist
George M Hills	1938–	biochemist
Donald D Woods	1939–	bacterial chemist

Figure 1 Fildes's research team, 1929–1941

Society of Medicine in October 1934, Fildes urged chemists to take an interest in the physiology of the host-parasite relation, and urged bacteriologists to study the chemistry of bacterial nutrition and metabolism.[49] Yet the hoped-for balance of chemical and medical imperatives was elusive, even for him. In the early 1940s, Fildes complained repeatedly about biochemists' neglect of medical aims.[50] Yet he himself had done little to correct the imbalance, having gone over completely to the biochemical side. Opportunity, reform ideology, and the momentum of team research had drawn Fildes into a new and not wholly comfortable scientific world.

"Essential Metabolites" and the Origin of Disease. Although Fildes's discoveries in bacterial nutrition appear to us now as straight biochemistry, to Fildes they had a larger biological significance. He saw nutritional requirements as clues to the evolutionary relationships between bacterial species as well as to the origin of infectious diseases. Each essential metabolite represented, to Fildes, a synthetic capacity lost in the course of evolution as bacteria adapted to chemically richer biotic environments. The earliest bacteria, he supposed, emerged in an inorganic world devoid of organic substances These primitive organisms were obliged to synthesize all the constituents of protoplasm from inorganic salts, carbon dioxide, and ammonia. They were themselves a source of complex organic matter, however, and new organisms evolved that synthesized their protoplasm from the components of dead or ingested cells As a result, some bacteria lost the capacity to synthesize essential cellular components. Some evolved an exclusively parasitic mode of life in animal tissues, losing the capacity to synthesize vitamins and other complex compounds in the process of becoming (from the host's point of view) pathogenic.[51] Nutritional requirements were, for Fildes, clues to the genesis and physiology of disease states, and the term "essential metabolites" was meant to convey the full freight of his biological theory The discovery of nutritional requirements seemed, to him, to be laying the groundwork for a more theoretical science of bacteriology.

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[49] Paul Fildes, "Some medical and other aspects of bacterial chemistry," *Proc Roy Soc Med*, 1934, *28* 79–90 See esp pp 81–82

[50] Fildes to E Mellanby, 21 and 26 June 1943, Fildes to M Stephenson, 11 Sept. 1945, MRC 2519, Fildes to Charles R Harington, 7 July 1944, MRC 280

[51] Fildes, "Some medical and other aspects," pp 87–89

This idea was unusual but not idiosyncratic. Fildes was probably drawing on a now forgotten countercurrent of thought in British pathology. It is difficult to pinpoint a specific source, but a likely candidate is the controversy circa 1900–10 over the phylogenetic relationships among the acid-fast bacteria. The question was whether the bacilli of human, bovine, avian, and equine tuberculosis were different species or varieties of one species. An analogous problem was the relation between the pathogenic tubercle bacilli and the similar but harmless saprophytes like the Timothy grass bacillus, *Mycobacterium phlei*, found on pasture grasses. These were vital theoretical problems, given the medical importance of tuberculosis at the time. They were politically explosive too, since the answers had large implications for the right of governments to control the dairy and meat industries. Bacteriologists in Germany and France were most sharply divided. In Britain a Royal Commission, appointed in 1903 to decide the issue experimentally, dampened controversy in the British medical press. Nevertheless, for bacteriologists of Fildes's generation, bacterial variability and phylogeny were highly charged theoretical and practical issues[52]

There are indications that these questions were actively discussed among the London Hospital pathologists during the time that Fildes was getting started in his career. William Bulloch believed that the human tubercle bacillus had developed from saprophytes, adapting gradually to an exclusively parasitic mode of life.[53] Although he did not use the language of evolutionary biology, others in his group did, most notably Frederick Twort, Fildes's predecessor as Bulloch's assistant. Moreover, Twort connected the issues of phylogeny and bacterial metabolism in a way that strikingly anticipates Fildes's later work.

A brilliant and idiosyncratic man, Twort was famous for his discovery of the bacteriophage, and was notorious for his reclusive and eccentric behavior as director of the Brown Institute.[54] As Bulloch's assistant, Twort worked on methods for growing the acid-fast bacilli of leprosy and Johne's disease in vitro. In 1910–12 he discovered that these bacilli flourished in vitro if essential nutrients were supplied in the form of dead human tubercle bacilli.[55] The morphological similarities of these acid-fast organisms had suggested to Twort that the chemistry of their protoplasm must be similar too, and that one could supply essential constituents to the others. He speculated further that in the course of evolution to a parasitic mode of life, Johne's bacillus

[52] See Russell C Maulitz, "Robert Koch and American medicine," *Ann Int Med*, 1982, *97* 761–66

[53] William Bulloch, "The morphological and physiological variations of the *Bacillus tuberculosis* and its relations (a) to other acid-fast bacilli, (b) to the ray fungus and other streptothriceae," *Trans. Brit Congr Tuberc 1901* (London. William Clowes, 1902), vol III, pp 494–502, 503–7, William Bulloch, "The treatment of tuberculosis by tuberculin," *Medico-Chirurgical Trans*, 1906, *89* 69–84 Bulloch was characteristically noncommittal on the vexed question of species transmutation.

[54] Paul Fildes, "Frederick William Twort, 1877–1950," *Obit Notices Fellows Roy Soc*, 1951, 7 505–17

[55] Frederick W Twort, "A method for isolating and growing the lepra bacillus of man," *Proc Roy Soc, B,* 1910, *83* 156–58, Frederick W Twort and George L Y Ingram, "A method for isolating and cultivating the *Mycobacterium enteridis chronicae pseudotuberculosae bovis Johne* ," *ibid*, 1912, *84* 517–42

had lost the ability to make some factor essential to growth outside its preferred host.[56]

Twort's ideas were not original with him either. Theobald Smith had made a similar suggestion in 1887, and referred to a still earlier tradition of thought of the pioneer German bacteriologists Ferdinand Huppe and Anton de Bary[57] Twort may have been the source of Fildes's idea of "essential metabolites" Both were certainly drawing on an older line of thought which had never been fashionable in a discipline populated by morphologists and diagnosticians, but which remained endemic among groups who had particular reasons to keep it alive. Bulloch's group at the London Hospital appears to have been one such group. Twort and Fildes never framed their biological notions as programmatic theory, but they did deploy them at strategic points Twort, in his work on the lepra and Johne's bacilli, and bacteriophage, Fildes, in his work on *B influenzae* and bacterial nutrition.

Fildes's biological idea was not a logical necessity for discovering new essential metabolites; nor was it a guide to selecting organisms for study It does not seem to have been a heuristic for applying biochemical knowledge to disease processes. Fildes did speculate in 1934 that the pathology of bacterial infections might be understood as localized nutritional deficiencies, but he never pursued the idea experimentally[58] What then was the relation between biological theory and biochemical practice?

I believe that Fildes's theory of "essential metabolites" sustained his interest in what was becoming pure biochemistry. It must be kept in mind that most bacteriologists who began work on bacterial nutrition in the 1920s soon lost interest and reverted to mainstream medical problems. Biochemistry per se offered little incentive for them to continue that line of work. Fildes too suffered from the disapproval or indifference of his medical peers, but was able to persist in developing a hybrid field because he believed that his work would ultimately prove meaningful for biology and medicine. Although Fildes never did research on the physiology and evolution of parasitism, his belief in that ultimate purpose made systematic surveys of bacterial nutrition more than biochemical fact-gathering[59] By insisting on the deeper meaning of "essential metabolites," Fildes hoped to differentiate his group both from orthodox biochemists, who were interested only in chemical reactions, and from clinical bacteriologists, who were interested merely in improving diagnostic typing.[60] Hoping for a sympathetic hearing from pathologists, Fildes tried to make it clear that his work was inspired by a concern for the physiology of disease.

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[56] Frederick W Twort and George L Y Ingram, *A Monograph on Johne's Disease* (London Baillière, Tindall & Cox, 1913), pp 88–100

[57] Theobald Smith, "Parasitic bacteria and their relation to saprophytes," *Amer Nat*, 1887, *21* 1–9

[58] Fildes, "Some medical and other aspects," pp 88–90

[59] Knight, *Bacterial Nutrition*, pp 137–61

[60] The importance of sharply defined nutritional characters for bacteriological diagnosis was probably the most important reason for the continuing strong belief in the invariability of bacterial species Clinicians who depended on the fixity of bacterial species for reliable, reproducible diagnosis could not afford to believe otherwise

Fildes's biological ideas were a source of intellectual novelties. For example, Fildes and Knight were especially interested in transitional forms of bacteria and instances of adaptation to changing environments. Such phenomena only complicated the lives of chemists and diagnosticians, but for Fildes they were welcome evidence for dynamic relations between bacterial species. In his 1936 monograph, Knight gave much attention to facultative organisms, which grow preferentially in air or in rich media, but which adapt to growth without air or on minimal media.[61] Knight's point was that such adaptive behavior might illuminate the basic mechanisms of biological regulation

Fildes and Knight were also interested in the ability of bacteria to alter their enzymes in response to specific chemical substances. In one of their first papers, for example, they reported wide variability in the enzymes of *B. sporogenes,* including several adaptive enzymes.[62] Although adaptation was a temporary physiological process, not a genetic mutation, Fildes suggested that it was a first step in the genesis of pathogenic parasites. If the process of physiological adaptation were repeated often enough, he argued, it could produce heritable characters in bacterial cells.[63] Knight made the point in more detail:

> The ability to change under the stimulus of the environment provides a mechanism in accord with the theory of evolutionary development of bacteria by nutritional stages. In our view, the possibility of changing the enzymes of protoplasmic synthesis . results from this being a *reversion* to a more primitive metabolism [I]t seems probable that training from complex nutrients to simpler nutrients ... is of the same type of phenomenon as the production of new "adaptive" enzymes[64]

Endorsing Marjory Stephenson's idea that adaptation was a chemical reaction between cell protoplasm and chemical compounds outside the cell, Fildes and Knight helped arouse wider interest in this important scientific problem

Sulfonamides, 1939–1940. Fildes's theory of essential metabolites was also implicated in the dramatic discovery of the mechanism of action of the sulfonamide antibiotics by Fildes and the biochemist Donald D. Woods. The idea that sulfonamides inhibited bacterial growth by displacing para-aminobenzoic acid (PAB) in an essential enzymic reaction has generally been seen as a triumph of biochemical reasoning. In part it was: Woods, a scion of

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[61] Knight, *Bacterial Nutrition,* pp 137–77

[62] Paul Fildes, Gareth P Gladstone, and Bert Knight, "The nitrogen and vitamine requirements of *B typhosus,*" *Brit J Exp Path*, 1933, *14* 189–96, Paul Fildes and Bert Knight, "Tryptophane and the growth of bacteria," *ibid.,* 343–49

[63] Fildes, "Some medical and other aspects," pp 85–88

[64] Knight, *Bacterial Nutrition,* pp 173–74

Marjory Stephenson's school, was the one who recognized the structural resemblance between sulfonamides and PAB, and made the analogy with substrate inhibition of enzymes. But these insights can also be seen as a vindication of Fildes's biological vision, as Fildes himself repeatedly insisted.

Fildes became involved in the sulfonamides through James McIntosh, who was one of the many pathologists working on the problem in the late 1930s. There were many competing theories of how these drugs worked: some thought they stimulated the body's immune system; others, that they neutralized bacterial toxins; still others that they blocked destruction of autotoxic peroxides. By 1939, however, many pathologists favored the view that sulfonamides somehow interfered with enzymes required for cell growth. McIntosh came to this conclusion early in 1939, when he and Lionel Whitby unequivocally showed that sulfonamides did not stimulate phagocytes.[65] According to Donald Woods, McIntosh's views "were certainly inspired by informal tea-time discussions with Fildes and his colleagues."[66] McIntosh's interpretation of the evidence is indeed thoroughly infused by Fildes's theory of "essential metabolites." In April 1939, McIntosh turned the whole investigation over to Fildes's group.[67] Woods later remarked that the problem was "tailor made for the Fildes Unit with their wide experience of the detection and isolation of vitamin-like substances"[68] It may be more accurate to say that Fildes had tailored the problem to fit the capabilities of his team.

Fildes had been working on the problem of bacterial inhibition for some years prior to 1939. In 1937 he had argued that oxidizing dyes like methylene blue inhibited the growth of *Staphyloccus aureus* by converting sulfhydryl compounds essential for growth to their inactive oxidized form.[69] Mercuric salts, which formed insoluble precipitates with sulfhydryl compounds, presumably inhibited *S. aureus* in the same way.[70] In a third case, the growth of *E. coli* was inhibited by indolacrylic acid, an intermediate in the metabolism of the essential metabolite, tryptophane.[71] These simple cases confirmed Fildes's conviction that anti-bacterials in general acted by depriving bacterial cells of essential metabolites.

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[65] James McIntosh and Lionel Whitby, "The mode of action of drugs of the sulphonamide group," *Lancet,* 1939, *1* 431–35

[66] Donald D Woods, "The biochemical mode of action of sulphonamide drugs," *J Gen. Microbiol*, 1962, *29* 687–702 See pp 691–92

[67] McIntosh and Whitby, "Mode of action" McIntosh made three main points sulfanilamide inhibited growth only after a lag period (in which an essential metabolite was used up), sulfanilamide was more effective on virulent pathogens (because pathogens had acquired more requirements than saprophytes), larger doses of the drug neutralized correspondingly larger numbers of bacteria (because it acted as in a simple chemical reaction) The presentation is so infused with Fildes's theory that it is hard to distinguish fact from interpretation

[68] Woods, "Biochemical mode of action," pp 691–92

[69] Paul Fildes and George Richardson, "The nutrition of *Staphylococcus aureus* sulphur requirements," *Brit J Exp Path*, 1937, *18* 292–304, Paul Fildes, "The bacteriostatic action of O/R dyes," *Proc. 2nd Int Congr Microbiol.* (London Harrison, 1936), p 37

[70] Paul Fildes, "The mechanism of the anti-bacterial action of mercury," *Brit J Exp Path*, 1940, *21* 67–73, Paul Fildes, "A rational approach to research in chemotherapy," *Lancet,* 1940, *1* 955–57

[71] Paul Fildes, "The inhibition of bacterial growth by indolacrylic acid and its relation to tryptophane an illustration of the inhibitory action of substances chemically related to an essential metabolite," *Brit J Exp Path*, 1941, *22* 293–98, Fildes, "Indole as precursor of tryptophane," *ibid*, 1940, *21* 315–19

Sulfonamides, Fildes assumed, acted in precisely the same way, and since his team had recently described all the metabolites essential to the growth of *Streptococcus haemolyticus,* it was simply a matter of finding which one of them would counteract the inhibitory effect of sulfonamides Fildes was pretty sure that it was glutamine, which was similar chemically to the sulfonamides[72] In fact, glutamine had no effect at all; nor did any of the other metabolites required by *S. haemolyticus.*[73]

Fildes was surprised, but not at a loss. According to his theory of the origin of pathogens, not all essential metabolites had become nutritional requirements He concluded that *S haemolyticus* had not yet lost the ability to synthesize the unknown metabolite blocked by sulfonamides. But how was he to find out what it was? At this point, he read a paper by T. C. Stamp, a bacteriologist at London University, reporting that an extract of *S. haemolyticus* exerted an antagonistic effect on sulfonamide inhibition.[74] Stamp had not isolated the active substance, but suggested that it was a coenzyme or rare amino acid. This result confirmed Fildes's theoretical prediction; the problem now was a practical one of fractionating *S. haemolyticus* extract.

Streptococcus haemolyticus was difficult and dangerous to grow on a large scale, however, and Fildes's unit was not equipped for large-scale work. Fildes's theory suggested a shortcut. Believing that the metabolic machinery of all cells was much the same, Fildes assumed that yeast would be as good a source of the unknown metabolite as bacteria, and yeast could be purchased by the hundredweight from local breweries. Fildes prepared a trial extract, and showed that it too reversed the inhibitory effects of sulfonamide.[75] In August 1939 Fildes handed the problem over to Donald Woods.

The rest of the story is well known Qualitative tests of a partly purified yeast extract suggested that the unknown metabolite resembled sulfanilamide chemically, and PAB was the obvious analogue. Woods made the test with *S haemolyticus* in December, with a positive result. PAB reversed the inhibitory effect of sulfonamides on cell growth. It was still unclear what metabolic reaction was interfered with, but Fildes's theory of "essential metabolites" was vindicated.[76]

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[72] Paul Fildes, Hugh McIlwain, Gareth Gladstone, and Bert Knight, "Glutamine and the growth of *Streptococcus haemolyticus,*" *Biochem J*, 1939, *33* 223–29; Paul Fildes and Gareth Gladstone, "Glutamine and the growth of bacteria," *Brit J Exp Path*, 1939, *20* 334

[73] Paul Fildes, "A rational approach to research in chemotherapy," *Lancet,* 1940, *1* 955–57

[74] T C Stamp, "Bacteriostatic action of sulphanilamide in vitro," *Lancet,* 1939, *2* 10–17 Stamp used the same technique that Twort had used to grow the lepra and Johne's bacilli

[75] Donald D Woods, "The relation of *p*-aminobenzoic acid to the mechanism of the action of sulphonamide," *Brit J Exp Path*, 1940, *21* 74–90 See pp 74–76, 88–89, Woods, "Biochemical mode of action," pp 691–92, Ernest Gale and Paul Fildes, "Donald Devereux Woods 1912–1964," *Biog Mem Fellows Roy Soc.,* 1965, *11* 203–19 See pp 206–7 Woods noted that he had done experiments with crude bacterial extracts before Stamp's paper encouraged him to try yeast. This was, of course, the technique used by Twort and by Fildes in his early work on *B influenzae*

[76] Woods, "Biochemical mode of action," pp 692–96

As in the cases of tetanus germination and bacterial vitamins, Fildes's biological vision was crucial to innovative thought It enabled Fildes to define the problem as one for bacterial chemists, and kept the range of possible analogies open at a time when most of those thinking about sulfonamides were captives of one or another fixed idea.[77] Because of his evolutionary perspective, he was not at a loss when glutamine did not work The decision to try yeast extract saved months of labor at a time when other groups were eagerly pursuing the mysterious factor

Fildes and Woods' discovery was an instant sensation, but they did not enjoy the fruits of it They spent the years of World War II at the Army's experimental station at Porton doing secret bacteriological work and watching others build upon their innovation.[78] When Fildes returned to reconstitute his research team in 1945, the world had passed him by.

Conclusion A number of pathologists in the early 1920s saw physiology and biochemistry as the key to understanding infectious diseases and for designing therapeutics. Of all the various initiatives that were tried, however, Fildes's was almost the only one that survived in the long term. Most programs reverted to "classical" bacteriology. Fildes's success depended on a conjunction of circumstances· Bulloch's department isolated Fildes from attractive opportunities in medical bacteriology and gave him access to an old-fashioned but unexpectedly fruitful point of view. His first tentative investments in biochemical routines and team research led him on to invest still more The MRC provided encouragement and security to innovate in an area that lacked an academic reward system, and biochemical fashion provided a wider audience for the output of Fildes's team

The National Institute of Medical Research provides a revealing contrast. In the early 1920s Fletcher and Henry Dale planned to make the NIMR a center of work in bacterial chemistry. It did not happen. Just before his death in 1933, Fletcher reflected bitterly on what had gone wrong, and why there was nothing comparable at the NIMR to Oswald Avery's Rockefeller Institute group. There was no mystery about it: in 1922 a decision was made to concentrate the NIMR's programs in virology, and by 1930 all the senior bacteriologists but one were working on viruses. Bruce White, the one exception, was tied to routine work in the National Collection of Type Cultures. Bacterial physiology had entirely disappeared from the center of British bacteriology.[79] Risky or idiosyncratic innovations could not compete for resources and talent. They do better, it seems, in locales that are insulated from mainstream pressures and connected in some way with other disciplines.

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[77] See John S Lockwood, "Studies on the mechanism of the action of sulphanilamide," *J Immunol*, 1938, *35* 155–92, Arthur Locke, E R Main, R R Mellon, "Anti-catalase and the mechanism of sulphanilamide action," *Science*, 1938, *88* 620 H N Green, "The mode of action of sulphanilamide ," *Brit J Exp Path*, 1940, *21* 38–64, Philip Shaffer, "The mode of action of sulphanilamide," *Science*, 1939, *89* 547–50 See also correspondence in Shaffer Papers, folders 81, 118 and 128, Washington University Medical School Archives, St Louis, Missouri

[78] Hugh McIlwain continued work on sulfonamides at Sheffield and earned Woods and Fildes' lasting resentment for allegedly giving them too little credit. William W C Topley to A L Thomson, 11 July 1939, Thomson to Fildes, 25 July 1939, Fildes to E Mellanby, 25 Aug and 22 Sept. 1939, 15 Mar 1944, Mellanby to Fildes, 25 Sept 1939, MRC 1300/1, Mellanby memorandum 30 Mar 1944, memoranda, 30 Mar 1944, 1 Nov 1946, MRC 497, Fildes to Harington, 7 July 1944, MRC 280, Gladstone et al, "Fildes," pp 335–37

The convergence of Fildes's and Stephenson's style of bacterial physiology reflects their similar institutional circumstances Despite their different disciplinary roots, both drew inspiration from comparative physiology and evolutionary biology; both participated, at different levels, in the movement for making medical education more science-intensive. Both were sustained by Fletcher's vision and MRC funds. Although Stephenson worked at the center of British biochemistry, she was protected by Hopkins's idiosyncratic program from the pressures of biochemical orthodoxy, just as Fildes was by Bulloch's internal exile. Stephenson's eclectic interests and Fildes's single-minded pursuit of one problem likewise reflect the differences in organization of research in an academic department and a multi-disciplinary research team.

Both Fildes and Stephenson managed to evade the inherent limitations set by the habits and structures of the disciplines in which they were trained. Both, however, ultimately encountered limits inherent in the intellectual visions that had inspired them and enabled them to innovate. Neither felt really at home in the new world of bacterial genetics. Stephenson's conception of enzyme adaptation as a chemical reaction made it difficult for her to assimilate the new idea of specific genetic regulation. Fildes's evolutionary conception of essential metabolites led him to support the losing side in the last battle over the inheritance of acquired characteristics in bacteria in the late 1940s.[80] The discovery of bacterial genetics shifted attention away from physiological complexities to cleaner problems of gene mapping and gene expression.

The widespread use of antibiotics after 1945 swept away the rationale for investigating the complex physiology of the host-parasite relationship. Fildes's long-range physiological program was set aside for systematic searches for more "magic bullets." Unable to assimilate the new bacterial and phage genetics, Fildes never again achieved the leading role that he had enjoyed in the 1930s. His theory of the origin and physiology of parasitism was forgotten. Only the bare facts of bacterial nutrition remained as a resource for biochemists and geneticists to use for their own, quite different ends.

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[79] W M Fletcher to M Stephenson, 9 Nov 1931, MRC 2036/2 Fletcher, memorandum, "Researches in Bacterial Chemistry," 19 May 1933, MRC 1300/1, Henry H. Dale to Fletcher, 28 Mar 1931, MRC 1115/1.

[80] Paul Fildes and K.W Whitaker, " 'Training' or mutation of bacteria," *Brit J Exp Path*, 1948, *29* 240–48

STRATEGIES THAT LED TO THE ERADICATION OF SMALLPOX IN PUERTO RICO, 1882–1921

José G. Rigau-Pérez

From the beginning of the Spanish colonization of Puerto Rico, smallpox was "the knife exterminating these lands."[1] In 1518, smallpox killed as many as two-thirds of the indigenous Taino population.[2] Its reappearance in 1689 meant the death of one-fourth of San Juan's citizens and the establishment of the disease as an endemic problem that flared up frequently throughout the eighteenth century.[3] Dr. Francisco Oller, who in 1792 had used variolation to control an epidemic in San Juan, was also the first person to use Jennerian vaccination in Puerto Rico in 1803.[4] For the next sixty years the existence of vaccine in the island depended on a fragile chain of arm-to-arm transmissions. With this method, the vaccination of a susceptible person produced a vesicle from which lymph fluid was then taken to use in other patients. The supply of fluid was scarce and occasionally exhausted and had to be imported on the arms of recently vaccinated children or slaves.[5] Every few years the military governors of Puerto Rico found it necessary to repeat their admonitions to mayors and town physicians to keep the population vaccinated and to watch for the development of epidemics.[6] By the 1870s, scientific advances made possible the local use of calf vaccine, even though it had to be imported at high prices.[7] Calf vaccine (non-humanized cowpox fluid) consisted of lymph from cowpox vesicles pro-

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[1] Iñigo Abbad y Lasierra, *Historia geográfica, civil y natural de la isla de San Juan Bautista de Puerto Rico* (San Juan, 1866), p 437

[2] Salvador Brau, *La colonización de Puerto Rico*, 4th ed. (San Juan Instituto de Cultura Puertorriqueña, 1969), p 316

[3] José G Rigau-Pérez, "Smallpox epidemics in Puerto Rico during the prevaccine era (1518–1803)," *J Hist Med*, 1982, *37* 423–38

[4] *Idem*, "El doctor Francisco Oller (1758–1831)," *Bol Asoc. Méd Puerto Rico*, 1978, *70* 121–30

[5] Cabildo de San Juan [Municipal Council], Puerto Rico, *Actas*, 15 vols (San Juan Gobierno de la Capital, 1949–68), 14 (1815–17) minute no 28, Pedro de Angelis, *Misceláneas puertorriqueñas* (Puerto Rico, 1894), pp 26, 27

[6] Pedro Tomás de Córdova, *Memorias geográficas, históricas, económicas y estadísticas de la isla de Puerto Rico*, 6 vols (San Juan, 1831–33), 4 183, 5 213, 6 249, 369 and 406, Francisco Ramos, *Prontuario de disposiciones oficiales, 1824–1865* (Puerto Rico, 1866), pp 460, 511, 519–23, *Legislación ultramarina*, ed. Joaquin Rodríguez San Pedro et al, 16 vols (Madrid, 1865–69), 1 412

[7] Henry J Parish, *A History of Immunization* (Edinburgh and London E. & S Livingstone, 1965), p 31, Archivo General de Puerto Rico, San Juan, Fondo A, Legajo 124 (Sanidad), Expediente 18a. Each capillary tube (ten vaccination doses) cost one dollar

duced in an unbroken series of calf-to-calf inoculations (see Figure 1). The calf product was used directly to vaccinate a person or was packaged for transport in different ways: the entire vesicle taken from the animal could be kept in a vial with glycerine and then used for vaccinating; the dried fluid could be stored in a quill slip or packaged as a crust, to be moistened and used for vaccination within a week of packaging; or the lymph could be preserved for long periods in a completely filled, sealed capillary tube The latter method was used for transporting the vaccine over long distances.[8]

A decree by the governor of Puerto Rico in 1876 made vaccination compulsory on the island, but even so, there was a severe smallpox epidemic in 1880–81.[9] Because of the difficulties and expense encountered when it became necessary to import large quantities of vaccine from Cuba, Spain, and England, the government decided to establish a local Institute of Vaccination.[10] Dr Antonio Sierra y Carbó, a vaccine expert from Madrid, arrived in Puerto Rico in 1881. For several months he propagated vaccine fluid in calves and conducted vaccinations successfully. In August 1882, the Puerto Rico Provincial Institute of Vaccination was inaugurated, sponsored by the Diputación Provincial (the island's token advisory council to the governor), with Dr. Sierra as director and Dr. José Elías Herreros, a military physician, as deputy director The Institute was responsible for producing and maintaining a constant supply of fresh vaccine by successive inoculations of calves and for distributing the lymph for use in humans (by direct vaccination from the calf or indirectly via the shipment of glycerinized vesicles or sealed capillary tubes to the towns).

For direct vaccination, yearly expeditions of inoculated cattle went from San Juan to each town for public immunization sessions. Extra expeditions would be arranged in case of an epidemic The yearly expeditions would remain in a municipality for one to three days, depending on the number of its inhabitants. Most of the population, dispersed in the rural areas, had to come to town early in the day to be vaccinated, since vaccinations were performed for only four to six hours.[11] After the expedition left, the town physicians would use the arm-to-arm method to spread the vaccine.[12] From 1882 to 1886 there was no need to import vaccine fluid, even when 28,000 persons in Puerto Rico were vaccinated by Institute personnel, an additional number of persons, felt to be far smaller, was vaccinated by town physicians.

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[8] The New York Dispensary, *Vaccine Virus* (New York, 1872), p 3

[9] Lidio Cruz Monclova, *Historia de Puerto Rico (siglo XIX)*, 3 vols in 6 parts (Puerto Rico Editorial Universitaria, 1952–64), 2(2) 455, 867

[10] Domingo Arecco y Torres, *Recopilación de dispociones oficiales* (Mayaguez, PR., 1889), pp 608, 609, Archivo Histórico Nacional (Madrid), Ultramar, Legajo 5116, Expediente 14, no 1

[11] José Elías y Herreros, *De la vacuna animal en la isla de Puerto Rico* (Puerto Rico, 1886), pp viii, 44, 67 and 93–96, for Elías's photograph, see José G Rigau-Pérez, "José Elías y Herreros (1847–1908)," *Bol Asoc. Méd Puerto Rico,* 1984, 76 314

[12] José Elías y Herreros, *Instituto Provincial de Vacuna de Puerto Rico Memoria expresiva de los trabajos del mismo en el año 1891–1892* (Puerto Rico, 1892), p 5 Reports on the Institute's work were also published for the years 1893–94 (in 1894), 1894–95 (1895), and 1895–96 (1897)

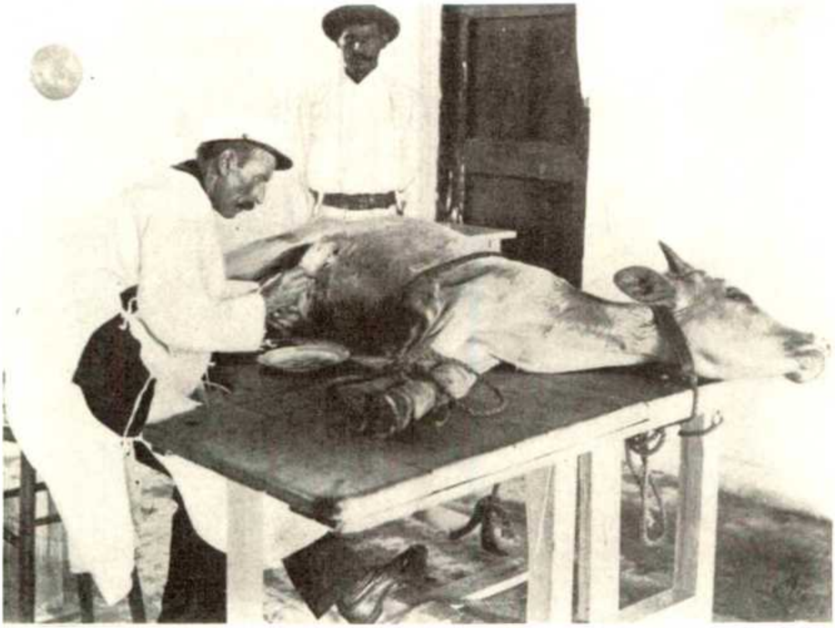

Figure 1. Charging vaccine points. Published in U.S. War Department, *Report of the Military Governor of Porto Rico on Civil Affairs, 1899–1900* (Washington, D.C.: Government Printing Office, 1902), p. 494.

This was considered a marked improvement over the conditions of the past, in terms of people and places reached and in terms of reduced public expenditures.[13] The Institute's yearly budget was 7,500 pesos (present-day $61,000).[14]

Dr. Sierra's plans, as presented to the government in Madrid, had been to vaccinate all children in the year they were born, a number he estimated at 23,000 per year.[15] Dr. Elías, director of the Institute after Sierra's departure in 1884, calculated that, because the annual number of births was close to

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[13] Elías, *Vacuna animal,* pp. 70–72.

[14] U.S. War Department, (George W. Davis), *Report of the Military Governor of Porto Rico on Civil Affairs, 1899–1900* (Washington, D.C.: U.S. Government Printing Office, 1902), p. 619. My estimates of the present day equivalence of old monetary figures are based on data from three references listed below, from which was constructed the following formula: $1982 = 290.6 ($x/CPIx). ("$1982" means present-day dollars, "$x" = dollar amount in year x, and "CPIx" = consumer price index in year x.) These estimates are inaccurate for many reasons (even more so the conversions from pesos), but give some idea of what the monetary figures meant in their time. Large figures have been rounded off to the nearest hundred or thousand. The references used were Biagio Di Venuti, *Money and Banking in Puerto Rico* (Rio Piedras: University of Puerto Rico Press, 1950), p. 17 (in the late 1890s, 1 peso = $0.75); U.S. Bureau of the Census, *Historical Statistics of the United States: Colonial Times to 1970* (Washington, D.C.: Bureau of the Census, 1975), p. 211; and U.S. Bureau of Labor Statistics, *Consumer Price Index, Detailed Report, Data for June, 1982* (Washington, D.C.: Bureau of Labor Statistics, 1982), pp. 1, 108.

[15] Archivo Histórico Nacional (Madrid), Ultramar. Legajo 5116, Expendiente 14, no. 1.

61,000, there were about 243,000 births between 1882 and 1886. With only 28,000 vaccinations in the same period, less than 12 percent of the objective had been attained.[16] The reasons for the failure, as he saw them, included the indifference, if not outright hostility, to vaccination of some of the population, the inefficiency of the cattle expeditions, which reached only a small proportion of the rural population, and the infrequency of arm-to-arm vaccination sessions in the towns.[17]

Dr. Elías left Puerto Rico in 1887 on sick leave.[18] The Institute was directed in that year by Dr. Pedro S. Caimary, with a more limited budget (4,000 pesos) to pay for the supply of 2,000 vaccine pustules per year.[19] For every additional pustule necessary (several people could be vaccinated with the fluid from one pustule), the Institute would be paid one peso (present-day $8). The government charter also established a procedure for judging claims of vaccine failure or of delays in fulfilling the contract.[20] In 1890, smallpox caused 2,362 deaths throughout Puerto Rico, a clear signal that better protection of the population was needed.[21] The following year Dr. Elías again took charge of the vaccine services, under new regulations regarding his duties and the duties of mayors, town physicians, and heads of households. The Institute, for a yearly payment of 2,400 pesos from the Diputación Provincial, was to send vaccine lymph to the towns every month, either as glycerolized vesicles or in capillary tubes. Mayors were to make sure that municipal physicians conducted vaccinations in all divisions of their jurisdiction. Heads of families were to be given at least twenty-four hours advance notice of the vaccination session that they should attend, and if they failed to comply by not bringing their dependents, they were to be fined two to four pesos (present-day $16–32).[22] Municipal physicians occasionally went to great lengths in the fulfillment of their duties, if the work of Doctor Antonio Amadeo of Maunabo can be taken as an example. Caught without vaccine on a farm where smallpox was spreading, he resorted to the inoculation of smallpox itself and reportedly prevented any severe disease in the fifty or sixty workers who were susceptible to smallpox before the inoculation.[23]

Dr. Elías directed the Institute until 1898 and we know of the Institute's activities up to 1896 from his yearly reports.[24] The Institute conducted studies which determined that the glycerolized vesicle fluid was superior to the capillary tubes in maintaining the viability of the vaccine during shipment.[25] Vaccination sessions were held for members of the armed forces and inmates of prisons and charitable institutions.[26] The highest number of yearly vaccinations on the island during this period was achieved in the fiscal year 1894–95: 24,844 persons received a first or repeat vaccination.[27] Elías insisted, year after year, on the need to increase the number of vaccinated persons, especially infants, and again advocated the promulgation of compulsory vaccination.[28] In 1896, the governor ordered that all the population be vaccinated, but there is no evidence that this was undertaken.[29] In fact, the disease seems to have recrudesced by the end of the year, as evidenced by the local name for the frustrating political measures decreed by Spain in December 1896, "the reforms that came with smallpox."[30] Elías's reports do not show us the fluctuations in smallpox morbidity, as he was concerned primarily with the production and distribution of vaccine. Mortality from smallpox in the decade 1890–1899, when the island's population was under one million, ranged from the 2,362 deaths mentioned for 1890 (8.9 percent of all deaths for that year), to eleven deaths in 1893 (0.05 percent of the year's mortality), with a yearly average of 622 deaths from smallpox.[31]

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[16] Elías, *Vacuna animal*, pp. viii, 72.

[17] *Ibid.*, pp. 68, 72; see also Elías, *Instituto Provincial de Vacuna* for these years.

[18] Archivo General Militar de Segovia, Expediente personal de José Elías y Herreros (1847–1908), E-259.

[19] *Report of the Military Governor*, p. 619.

[20] Diputación Provincial de Puerto Rico, "Servicio Provincial de Vacuna: anuncio de subasta," *La Gaceta de Puerto Rico*, 12 May 1887.

[21] *Report of the Military Governor*, pp. 569–74. See especially p. 569.

[22] Diputación Provincial de Puerto Rico, *Reglamento para el Servicio Provincial de Vacuna de Puerto Rico* (Puerto Rico, 1891), pp. 5–10.

[23] M. Martínez Rosselló, *Sobre la vacunación* (Arecibo, P.R., 1897), p. 14.

[24] See Elías, *Instituto Provincial de Vacuna* for the various years as mentioned in note 12.

The Spanish-American War broke out in April 1898, and soon after, food was scarce and smallpox spread throughout the island.[32] An anonymous newspaper article in May complained that even though the government had created a Vaccine Institute and spent large sums on it, the existence of smallpox in the island proved that the system was a failure. The author of the article (signed "X") suggested the following measures: obligatory vaccination with a severe penalty for non-compliance, and the isolation of the present epidemic foci by the direct vaccination of the residents of infected towns and rural areas, taking the vaccination calves from house to house if necessary. This was to be followed by vaccinations of residents in the areas surrounding epidemic foci, and finally by the vaccination of the rest of the island's population.[33] In time of war, criticism is considered impertinent by governments and, with other problems taking precedence, these suggestions were ignored. The United States Army landed on 25 July 1898, and formally took possession of the island on 18 October 1898.

Fourteen weeks later, the American military governor, Major General Guy V. Henry (see Figure 2), ordered the vaccination of the entire population of the island. Army medical officers were appointed directors of

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[25] Elías, *Instituto Provincial de Vacuna, 1891–1892*, pp. 6, 7, 21.

[26] Elías, *Instituto Provincial de Vacuna, 1893–1894*, p. 16.

[27] Elías, *Instituto Provincial de Vacuna, 1894–1895*, p. 18.

[28] José Elías y Herreros, *La vacuna* (Puerto Rico, 1896), p. 17.

[29] Cruz Monclova, *Historia de Puerto Rico*, 3(3): 145.

[30] Carmelo Rosario Natal, *Puerto Rico y la crisis de la Guerra Hispanoamerica (1895–1898)* (Hato Rey, P.R.: Ramallo Brothers, 1975), p. 147.

[31] *Report of the Military Governor*, pp. 569–74.

[32] Rosario Natal, *Puerto Rico*, p. 178.

[33] "X," "La epidemia variolosa en la isla," *La Correspondencia de Puerto Rico*, 7 May 1898.

Figure 2. Major General Guy V. Henry. Oil painting by Francisco Oller, 1899. From the collection of the Governor's Mansion, San Juan, Puerto Rico.

vaccination for each of five districts and were obligated to report to Lieutenant Colonel John Hoff, the chief surgeon of Puerto Rico "any neglect on the part of the civil authorities to carry out this order."[34] With the assistance of U.S. Army hospital corpsmen, it was common for the vaccinators, mostly Puerto Rican physicians, to attend to 225 persons in a day.[35] In a parallel effort, the U.S. Marine-Hospital Service (now the Public Health Service) established quarantine offices in the island's ports and enforced the United States law which required vaccination of travelers to the continental United States and proof of vaccination from passengers who arrived in Puerto Rico from countries where smallpox was present.[36]

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[34] U.S. War Department, (George W. Davis), *Report of Brig. Gen. Geo. W. Davis, USV on Civil Affairs of Puerto Rico, 1899* (Washington, D.C.: U.S. Government Printing Office, 1900), p. 96 (General Order #7, 27 January 1899).

[35] C. H. Alden, "Puerto Rico, its climate and its diseases," *New York Med. J.*, 1901, *74*: 17–22; Henry K. Carrol, *Report on the Island of Puerto Rico* (Washington, D.C., 1899), p. 214.

[36] U.S. Treasury Department, *Annual Report of the Supervising Surgeon General of the Marine-Hospital Service of the United States for the Fiscal Year 1893*, 2 vols. (Washington, D.C., 1894), 1: 280; H. C. Corbin, "Maritime quarantine in Cuba and Porto Rico to be enforced by the Marine-Hospital Service," *Public Health Reports*, 1899, *14*: 119–20.

General Henry, who did not hesitate to dismantle Puerto Rico's system of self-government when it first hindered his actions, was determined to encourage vaccination by decree, and he ordered that persons who could not present a vaccination certificate after vaccination sessions were completed in their town were to be barred from school, employment, public transportation, theaters, and public gatherings[37]

Still some people persistently refused vaccination, and the succeeding military governor, General George W. Davis, decreed sterner measures to persuade recalcitrant citizens. Upon receipt of notification from the district's director of vaccination, mayors were to order citizens to assemble at a specific time and place for vaccination. Within ten days after the publication of the mayor's order, all inhabitants of the municipality were to undergo vaccination, or certify that they had been vaccinated in the previous year, or present evidence of their inability to attend a vaccination clinic. Those who did not comply were to be arrested and fined ten dollars (present-day $116) plus five dollars for each day thereafter until vaccinated. If the fine was not paid in forty-eight hours, the penalty was ten days' imprisonment, and thereafter, five days for each additional offense.[38] By 30 June 1899, 786,290 persons had been vaccinated (84 percent of the island's population), at a cost of $43,106 (present-day $501,000), all paid from the island's funds (except, of course, the salaries of military personnel involved).[39]

The vaccination campaign was ostensibly made necessary by the smallpox epidemic that had spread throughout the island, and that had prompted other countries to quarantine ships arriving from Puerto Rico.[40] The Army's first concern was the protection of its personnel. In the main urban areas, the disease was controlled by the efforts of Army health officers.

> Practically unchecked, however, in the outlying villages and the hill-country and aided by the peregrinations of the unsettled population and troops, it [smallpox] steadily took on greater proportions, no part of the island being free from it, until nearly all the country barrios (precincts) were infested and its reflex tide began to work back into the larger towns and cities.[41]

General Henry, either by his own determination or on the advice of one or another of his physician subordinates (Lieutenant Colonel Hoff or Major Azel Ames), then ordered the vaccination of civilians. Although in retrospect his decision seems farsighted, it was, at the time, not the only logical solution.

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[37] *Report of Gen. Davis*, p 154 (Circular #3, 18 March 1899)

[38] *Ibid*, pp 112–13 (General Order #80, 17 June 1899)

[39] John Van Rensselaer Hoff, "The share of the 'white man's burden' that has fallen to the medical departments of the public services in Puerto Rico," *Phila Med J*, 1900, *5* 796–99

[40] Alden, "Puerto Rico, climate, diseases," p 21

[41] Azel Ames, "Compulsory vaccination essential the example of Porto Rico," *Med News* (*NY*), 1902, *80* 721–28 The quote is from p 722

The Surgeon General of the Army made clear that his choice would have been to vaccinate all soldiers and to keep Army personnel out of civilian problems such as the epidemic. To the officers in Puerto Rico the general vaccination of civilians was a feasible undertaking because "there were ample authority (civil and military), men, means, and materials to work with."[42] Perhaps General Henry and his officers felt that vaccination of the civilians was necessary to prevent transmission to the troops, but if so, this reason was never used, then or later, to justify his orders. Instead, other explanations were given:

> the real reason why we are in the Antilles today is because our people had determined to abate a nuisance constantly threatening their health, lives and prosperity . . Spain was maintaining a pesthole at our front door and we could no longer endure it.[43]
>
> Hardly had the last representatives of Spanish misrule turned their backs upon the island before the American military administration, though wholly new to the science and are [*sic*—art?] of colonial government, set on foot, as an act of beneficence to the newly subordinated people, the vaccination of the entire population . .[44]

The exultant consciousness of American technical and economic power seems to have moved medical affairs just as it moved military affairs at the time. It is not surprising that the U.S. Army physicians were eager to embark on such a promising campaign, prolonging the excitement and adding to their victories in the Spanish-American War, and making a rapid demonstration of the superiority of the new government. Three years later Great Britain and the United States experienced an increase in the incidence of smallpox (*variola minor*). In the United States, the source of the epidemic was popularly believed to be the islands acquired during the war ("the late epidemic of smallpox . . . was the legitimate fruit of the Spanish American war"), and some of the names applied to the disease were the "Porto Rico scratches," and "Porto Rican chicken-pox."[45] Dr. Ames would recall at that time, with great pride, what he considered to be the "splendid achievements" of the Medical Corps during the war: demonstration of the value of ice baths in enteric fever, demonstration of ankylostomiasis as the cause of anemia, demonstration of the role of the mosquito in the transmission of yellow fever, and "the absolute demonstration that comprehensive *compulsory* vaccination, properly conducted, will *alone, certainly* eradicate smallpox from *any* region or people—as established conclusively in Porto Rico, in 1899."[46] That may have been his hope, but smallpox was not eradicated in Puerto Rico in 1899.

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[42] *Ibid*, p 723

[43] Hoff, " 'White man's burden,' " p 796

[44] Ames, "Compulsory vaccination essential," p 722

[45] James Nevins Hyde, "The late epidemic of smallpox in the United States," *Popular Sci Monthly*, 1901, *59* 557–67

[46] Azel Ames, "The vaccination of Porto Rico—a lesson to the world," *Pacific Med J*, 1902, *45* 513–32 Italics appear in the original.

The dark side of such nationalistic professional fervor was a profound mistrust and ignorance of the culture of the "newly subordinated people."

> For vaccinators, native physicians were used as largely as possible, as the plan has been in all relations with the natives to give preference to the Puerto Rican where he can do the work. A few Americans were employed as vaccinators, and almost without exception they did three to five times as much work as the natives, and in a far more satisfactory manner.[47]

Hoff described his public health efforts as "the share of the white man's burden that has fallen to the medical departments of the Public Services in Puerto Rico," while Ames referred to Puerto Rico as the "only 'white' island of the Antilles."[48] Ames decried the antipathy of the natives to leaving their own homes for isolation and treatment in hospitals or camps, not realizing that their behavior was justified by what he described in the following paragraph:

> the great difficulty of furnishing isolated care and treatment in pest-houses and camps for the hundreds of cases simultaneously occurring, owing to the great and inaccessible area over which they were spread, the inadequacy of the transportation, there being often no roads, and the paucity of help.[49]

The combination of technical proficiency and mistrust of all things Spanish probably accounts for the abolition of the Provincial Institute of Vaccination soon after the change of sovereignty. Major Ames found the Vaccine Station "nearly moribund at the American invasion" and could put no reliance on the amount or character of its product. He also believed that island authorities before the war made feeble efforts to vaccinate the population and isolate cases of smallpox, for the purpose of keeping the disease "somewhat in check, yet sufficient to furnish business to the local medical practitioners and an excuse for the existence of the health officer and his salary."[50] Ames therefore organized a new vaccine station in Coamo to produce the vaccination fluid locally with lymph imported from the United States and inoculated on cattle provided by a local farmer[51] Dr. Rodríguez Castro, the Provincial Institute's last director, published a letter in a newspaper on 28 April 1899, in which he stated that the smallpox vaccinations being performed were expensive and harmful, and complained that his contract to maintain a Vaccine Institute had not been renewed, when all other contracts had been renewed by the military government. A short time later, an order from General Henry's headquarters warned the newspaper editor not to publish similar articles complaining about the government or his paper would be suspended. Dr. Rodríguez Castro was notified to stop writing in criticism of the government or he would be prosecuted.[52]

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[47] S H Wadhams, "Smallpox in Puerto Rico," *Yale Med J*, 1899–1900, *6* 279–85 Quotation from pp 282–83

[48] Hoff, " 'White man's burden,' " p 796, Ames, "Lesson to the world," p 518

[49] Ames, "Compulsory vaccination essential," p 723

[50] *Ibid*, p 722

[51] Wadhams, "Smallpox in Puerto Rico," pp 280–81

A Superior Board of Health, established on 29 June 1899, took over the vaccination effort and the production of vaccine. Several more months of work were necessary to vaccinate the population in the remote mountainous areas (Utuado, Ciales, and Morovis), and the continued functioning of a vaccine station was assured.[53] The Board of Health restated the regulations requiring vaccination for teachers and students before admission to school and instituted new regulations for municipal vaccinations, including ten to two hundred dollar fines (present-day $116—2,325) and/or imprisonment for municipal officials who failed to comply with the vaccination program and reporting requirements. In spite of this, or perhaps as a result of improved surveillance, clusters of cases of smallpox continued to be reported, even in the more accessible coastal towns.[54] It is unlikely that the Superior Board of Health was able to continue an aggressive vaccination effort after 8 August 1899. On that date hurricane San Ciriaco passed over the island, and left 3,369 dead and a large proportion of the population homeless, unemployed and desperate.[55]

From 1901 to 1915, reports of cases of varioloid (*variola minor*) became frequent in the spring, but in different municipalities. Outbreak investigations revealed that many children had not been properly vaccinated, if at all, and that certificates had been granted before the success of vaccination was confirmed. Public health officials came to the realization that the immunization levels achieved with the general vaccination of 1899 were no longer existent.[56] On 1 August 1907, the Executive Council of Puerto Rico approved a series of regulations relative to smallpox vaccination, among them the stipulation that a valid certificate of vaccination be required before enrollment in a public school or employment in a shop or factory. It was also decided that, within six months, all the inhabitants of the island would be vaccinated or revaccinated. The Bureau of Health set out to implement a vaccination campaign, and almost 63,000 vaccinations were performed, starting in one district (Guayama).[57] At about this time, at least in Caguas, some injections were still performed with lymph taken directly from a calf tied down to a table, next to which children were vaccinated.[58] The general vaccination campaign of 1908 was never launched because, although the legislature approved a $52,000 (present-day $560,000) appropriation for the funding, the Executive Council vetoed it. The legislature, in turn, let the vaccine station close on 30 June 1908, choosing to have vaccine fluid imported rather than produced locally.[59]

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[52] Edward J Berbusse, *The United States in Puerto Rico, 1898–1900* (Chapel Hill University of North Carolina Press, 1966), p 94

[53] Hoff, " 'White man's burden,' " p 797–98

[54] *Report of the Military Governor,* pp 496, 503–7, 531 (General Order #170, 24 October 1899), pp 535, 536 (Circular #44, 14 December 1899)

[55] Carmelo Rosario Natal, *Exodo puertorriqueño las emigraciones al Caribe y Hawaii, 1900–1915* (San Juan. n p., 1983), pp 24–30

[56] Junta Superior de Sanidad de Puerto Rico, *Informe y estadística demográfica, mayo 1ro a junio 30, 1903* (San Juan Tip El País, 1904), pp 20, 21, 43, Governor of Puerto Rico, *Annual Report, 1900–1901* (Washington, D C. U S Government Printing Office, 1901), p 338 These reports were published from 1901–1950 Also see *Annual Report, 1901–1902,* p 285, *1906–1907,* p 37, *1907–1908,* p 24

[57] Governor of Puerto Rico, *Annual Report, 1907–1908,* p 290

From 1911 to 1915 there were twenty-four cases of smallpox, 449 cases of varioloid, and only about 11,000 vaccinations reported on the island.[60] In April 1916, reports of severe cases of chickenpox increased in Puerta de Tierra, a very poor working-class section of San Juan. It was not until the beginning of May that some cases were admitted to the quarantine hospital and were recognized to be smallpox. Cases occurred in or near San Juan and in the eastern half of the island. In a few towns the infection was traced directly to the capital, but it was impossible to determine if the outbreak in San Juan had started with a native or an imported case. The first step in controlling the disease was fortuitously taken before the outbreak occurred, since the 4,000 schoolchildren in San Juan were vaccinated in October 1915. No cases of smallpox appeared in the schools of San Juan. In each town where infection was reported, all inhabitants were allegedly vaccinated. The sick were removed from their homes, put in isolation until after the infective period passed, their houses were disinfected, and all persons in the neighborhood were immediately vaccinated. Lymph was imported quickly and in the first six weeks more than 40,000 persons were vaccinated. The epidemic was terminated within three months, by 31 July, after 529 cases of smallpox and ten deaths were reported. The government spent $21,139.14 (present-day $188,000), of which more than half went for the purchase of vaccine. The official report states that the epidemic was due "without question … first, to lack of funds, second, to lack of sufficient personnel, and third, to lack of interest on the part of the public."[61]

The next fiscal year, 1916–17, a total of 109 cases of smallpox, including four fatal cases, were reported, still in the eastern part of the island.[62] For the next four years only seven cases of smallpox were reported, three in the first year. A major immunization effort in 1918–19 achieved 183,405 vaccinations.[63] The last cases of smallpox in Puerto Rico were the result of two separate importations of disease, and reflected, as did the first cases of smallpox in the island in 1518, an epidemic in Hispaniola.[64] In October 1921, a man in the town of Naranjito developed fever and a vesicular rash hours after his arrival from the Dominican Republic. He had allegedly undergone two very recent unsuccessful attempts at vaccination but nevertheless developed smallpox and infected his brother. Also in 1921, another traveler from Santo Domingo brought the infection to five members of his household in the town of San Germán. The latter cluster is poorly described in the Governor's report for 1921–22. No mention is made of the traveler's vaccination status, and no dates of onset of illness are provided. Vaccinations of the general population were performed in the two towns, and there were no further cases and no deaths[65] These eight cases were the last cases of smallpox reported in Puerto Rico.

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[58] Margot Arce de Vázquez, personal reminiscence

[59] Governor of Puerto Rico, *Annual Report, 1907–1908,* p 290

[60] Governor of Puerto Rico, *Annual Report, 1911–1912,* pp 94–99, *1913–1914,* pp 12, 56, *1914–1915,* p 98; Director de Sanidad de Puerto Rico, *Informe Anual, 1912–1913* (San Juan Negociado de Materiales, Imprenta y Transporte, 1914), pp 61, 102

[61] Governor of Puerto Rico, *Annual Report, 1915–1916,* pp 96–99 The quotation is on p 96, W W King, "Smallpox in Porto Rico, 1916," *Public Health Reports,* 1916, *31* 1748–50

[62] Governor of Puerto Rico, *Annual Report, 1916–1917,* pp 200, 210, 211

[63] Commissioner of Health of Puerto Rico, *Annual Report, 1917–1918* (San Juan Bureau of Supplies, Printing and Transportation, 1919), p 173 These reports were published from 1916–47 See also Commissioner, *Annual Report, 1919–1920,* p 34, Governor of Puerto Rico, *Annual Report, 1918–1919,* p, 157, *1920–1921,* p 94

Public health officials in Puerto Rico continued routine large-scale vaccination of infants for twenty more years.[66] The possibilities of reintroduction of the disease diminished quickly after 1921, as smallpox was gradually eliminated from Cuba, Jamaica, and Trinidad (1925–30), and later, the Dominican Republic (1941)[67] A vaccination campaign was carried out in 1958–59, because of reports of cases of smallpox in nearby islands, and approximately 800,000 persons were vaccinated. No cases of smallpox occurred in Puerto Rico, but the vaccine caused some morbidity.[68] The last smallpox vaccination campaign in the island took place in 1967–68. One third of the population (835,471 persons) was vaccinated. One person died from probable post-vaccinial encephalitis and the overall complication rate was 201 reactions per million primary vaccinees.[69]

In summary, the different tactics for control of smallpox in Puerto Rico under Spanish rule were the following. vaccination of infants until, it was hoped, all the population would be covered; vaccination of captive and/or transient populations such as soldiers, sailors or prisoners; and vaccination of available presumed susceptibles at the time of an outbreak. Although Dr. Elías recognized the need for repeat vaccinations, he discussed it very little in his reports. These methods, even if their achievements are not well documented, were inadequate to control, much less eradicate, smallpox. It is unfortunate that we cannot assess the quality of Dr. Elías's laboratory work and the Institute's product, because any vaccination effort ultimately rests on a vaccine that is effective at the time of use, not just at the time of production, and glycerinated smallpox vaccine deteriorated quickly in tropical climates.[70]

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[64] Donald R. Hopkins, *Princes and Peasants Smallpox in History* (Chicago and London: University of Chicago Press, 1983), p 230

[65] Memorandum, Juan R. Palmer [Interim Assistant Secretary for Preventive Medicine Services] to Ernesto Colón Yordan [Secretary of Health], 21 January 1972, Smallpox file, Communicable Diseases Program, Puerto Rico Department of Health, on the subject of the last cases of smallpox in Puerto Rico, Governor of Puerto Rico, *Annual Report, 1921–1922,* pp 358–59 The latter report implied that the index cases in both clusters had escaped the detection of quarantine officers There is no comment on this in either the U S Public Health Service's *Public Health Reports* or the *Annual Report of the Surgeon General of the Public Health Service*

[66] Commissioner of Health, *Annual Report, 1940–1941,* p 20

[67] Global Commission for the Certification of Smallpox Eradication, World Health Organization, *The Global Eradication of Smallpox* (Geneva World Health Organization, 1980), p 67 This table also records six cases in Puerto Rico in 1930 This seems a typographical error, repeating the six cases reported in 1921–1922, because neither the Governor of Puerto Rico's *Annual Report* nor the *Public Health Reports* mention any cases of smallpox in the island that year

[68] José E Sifontes and E Mirabal Font, "Complications of smallpox vaccination," *Bol Asoc Méd Puerto Rico,* 1959, *51* 187–95

[69] Lynn Ratner, J Michael Lane and Carlos N. Vicéns, "Complications of smallpox vaccination surveillance during an island-wide program in Puerto Rico, 1967–1968," *Amer J Epidemiol*, 1970, *91* 278–85

The American military physicians aimed, in 1899, for universal immunization coverage by simultaneously vaccinating in all districts of the island. Two other mechanisms were to serve as safeguards or secondary lines of attack: the detection of unvaccinated persons at schools and workplaces and the vaccination requirements for travel. The vaccination campaign of 1899 had the scope and aggressiveness of a military operation. In spirit, if not in fact, it was the last battle of the Spanish-American War in Puerto Rico. It evokes the ambivalence of all good measures that are forced upon a population. A general vaccination could have been performed by a local civilian government, since most of the personnel used were local, but such a strong effort in public health would have been rare for any government of the time. Benjamin Waterhouse once remarked that Americans had "voluntarily submitted to more restrictions and abridgments of liberty to secure themselves against that terrible scourge [smallpox] than any absolute monarch could have enforced."[71] In 1899 no free society would have been able to impose upon its citizens an operation such as was carried out in Puerto Rico, making life very difficult for unvaccinated persons and penalizing anyone (especially mayors, physicians, and heads of households) who neglected to cooperate. We have no knowledge of how many people were fined, jailed, or excluded from work or school on the basis of the governor's orders of 1899, but judging from the incident with Dr. Rodríguez Castro, the orders were not to be taken lightly. The public's opinion on vaccination itself and on the actions of the military government cannot be gauged from official documents. The reactions of the medical community would be of great interest, considering that the vaccination campaign of 1899 was the first encounter of two different medical traditions, the American and the Spanish, both of which continue to coexist in Puerto Rico.

Cases of smallpox continued to appear after 1899, but the incidence and consequent mortality of the disease were markedly reduced after that date. In the following decade, greater attention than ever before was given to control of outbreaks. The steps taken to interrupt the epidemic of 1916 consisted of prompt isolation of cases and vaccination of immediate contacts, neighbors, and fellow townspeople. The anonymous newspaper article published in the midst of the Spanish-American War also suggested this approach, in a very schematic fashion. Both descriptions resemble superficially the surveillance and containment strategy that led to the 1977 global eradication of smallpox, but in their own time these methods did not seem to imply a rigorous pursuit of the eradication of smallpox from the island.[72] Smallpox control, rather than eradication, seems to have been the goal.

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[70] Donald A. Henderson, "The eradication of smallpox," *Scientific Amer*, 1976, *235* 25–33

[71] Waterhouse, quoted in Hopkins, *Princes and Peasants*, p 268

None of the vaccination plans described, whether those used in the 1890s, or 1899, or 1916, were able to eradicate the disease in Puerto Rico. Praiseworthy as the single efforts were, the eradication of smallpox in the island was a consequence of the additive effects of a sustained vaccination program, repeated special vaccination campaigns, and the interception of imported cases. Smallpox eradication was the first step in the elimination of the major causes of mortality in early twentieth-century Puerto Rico With the later eradication of malaria and the virtual disappearance of tuberculosis and parasitic infestations by the late 1940s, the public health problems of the island were transformed into the concerns of an expanding, urbanized, longevous population.[73]

[72] William H. Foege, J D Millar and Donald A. Henderson, "Smallpox eradication in west and central Africa," *Bull WHO*, 1975, *52* 209–22, Donald A Henderson, "Smallpox—epitaph for a killer?" *Nat Geog*, 1978, *154* 796–805 The "Leicester experiment" in England, circa 1901, was another foreshadowing of the final smallpox eradication strategy, see Hopkins, *Princes and Peasants*, pp 99, 304–5

[73] On 25 September 1983, the Commonwealth of Puerto Rico established by law that before gaining admission to school, all students under twenty-one years of age must fulfill the immunization requirements set up by the Health Department To comply with the law, nearly 500,000 persons under age twenty-one were vaccinated for polio, diphtheria, tetanus, pertussis, measles, rubella and mumps in the summer of 1983 A previous law (1974) required adequate immunizations only for students entering kindergarten or first grade As a result of the high immunization levels in elementary schoolchildren, and the active surveillance and control activities of the immunization program, only ninety-five cases of measles were reported in Puerto Rico in 1983

"DESIROUS OF IMPROVEMENTS IN MEDICINE": PUPILS AND PRACTITIONERS IN THE MEDICAL SOCIETIES AT GUY'S AND ST. BARTHOLOMEW'S HOSPITALS, 1795–1815

*Susan C. Lawrence***

When the members of Guy's Hospital Physical Society wrote out their first set of laws in 1775, they characterized themselves as gentlemen "desirous of improvements in Medicine, and the other Sciences nearly allied to it, and convinced of the numerous and great Advantages, arising from a free communication of Observations and Opinions . . ."[1] Historians unanimously echo these sentiments of the Society's founders: medical societies were worthy, useful organizations. They taught younger members, disseminated new theories and techniques, built libraries and promoted professional unity.[2] Of the eight medical societies active in London between 1795 and 1815, the three associated with major hospitals had special claims to these ideals.[3] By attracting a wide range of members, from students and local practitioners to eminent hospital men, the hospital societies both supplemented London medical education and strengthened the professional bonds between apothecaries, surgeons and physicians. At the same time, the soci-

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[1] GHMS, Wills Library, Laws of the Physical Society, 1775, Prologue, n p

[2] Anthony Batty Shaw, "The oldest medical societies in Great Britain," *Med Hist*, 1968, *12* 242–43, J M. H Campbell, "The History of the Physical Society," in *Guy's Hospital Gazette Bicentenary Number 1725–1925,* ed Leslie Housden (London Ash, 1925), p 107, Cuthbert E Dukes, "London medical societies in the eighteenth century," *Proc. Roy Soc Med*, 1960, *53* 700, George Newton Pitt, "Reflections on John Hunter as a physician and his relation to the medical societies of the last century," *Lancet*, 1896, *1* 1274, Sir Humphrey Rolleston, "Medical friendships, clubs and societies," *Ann Med Hist*, 1930, n.s *2* 263–64, J R. Wall, "The Guy's Hospital Physical Society (1771–1852)," *Guy's Hosp Repts*, 1974, *123* 159, 164–65

[3] The five general medical and surgical societies in London were the Medical Society of London (1773), the Society for the Improvement of Medical and Chirurgical Knowledge (1783), Lyceum Medicum Londinense (1785), the Medical and Chirurgical Society (1805), and the Westminster Medical Society (1805) The three hospital medical societies were Guy's Hospital Physical Society (1771), Middlesex Hospital Medical Society (1774) and the Medical and Philosophical Society of St. Bartholomew's Hospital (1795)

Bull Hist Med, 1985, *59* 89–104

eties served other, less explicit, purposes. In particular, they reinforced the importance of hospital instruction and practice, and provided additional opportunities for ambitious medical men to appear as active and concerned professionals.

Of the three hospital societies founded in the eighteenth century, at Middlesex, St. Bartholomew's, and Guy's hospitals, minute books have survived only for the latter two.[4] Those for the Guy's Hospital Physical Society begin in 1775 and run to 1852.[5] Those for St. Bartholomew's Hospital Medical and Philosophical Society survive from only 1799 to 1815, although the society continued to meet until the 1820s.[6] The minute books do not recount how the societies were established Tradition has it that Dr. William Saunders started Guy's Hospital Physical Society, importing the idea from Edinburgh, which had an active medical society for students.[7] It is likely that John Abernethy, among others, modeled the St. Bartholomew's society after the successful group at Guy's. Abernethy, an assistant surgeon at St. Bartholomew's hospital, was an active member of the Guy's Physical Society before 1799.[8] Neither society had any formal relationship with its host hospital, other than using the lecture theaters for meetings and small rooms to house libraries. They were connected with the hospitals primarily through the energy of staff physicians and surgeons, who often presided over the meetings, and also by their attraction for hospital pupils[9]

The existence of the minute books themselves tells us something immediately: the members took their societies seriously. They were not simple discussion groups or social clubs. While their laws, fines, dues and various orders of membership reveal a liking for formality, the fact that a secretary routinely took notes shows that the members thought their proceedings important enough to record both for immediate use and for posterity.[10] This study concentrates on what can now be learned from the minute books about the activities and interests of London medical men just prior to 1815.

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[4] Newton Pitt, "Reflections on John Hunter," p 1274, states that the Middlesex Hospital Medical Society records were lost.

[5] There are eleven volumes, 1775–1852, with a ten-year gap from 1825 to 1835 Volumes seven through nine were used for this study The minutes, housed at GHMS, Wills Library, are hereafter referred to as "GHPS, Minutes"

[6] The minutes are hereafter noted as "BHMPS, Minutes" The society continued to meet until 1827 according to Dukes, "London medical societies," p 705 In 1832 the hospital pupils resurrected it as the Abernethian Society See also Norman Moore, *The History of St Bartholomew's Hospital,* 2 vols (London· C Arthur Pearson, 1918), 2 826–27

[7] Newton Pitt, "Reflections on John Hunter," p 1271, Dukes, "London medical societies," pp 700, 702

[8] Victor C Medvei and John L Thornton, eds, *The Royal Hospital of Saint Bartholomew, 1123–1973* (London St. Bartholomew's Hospital, 1974), p 55 See also GHPS, Minutes, 3 December 1796

[9] Neither the minute books of the Court of Committees of Guy's Hospital (1757–1821) nor the Journals of the Board of Governors of St. Bartholomew's Hospital (1770–1815) mention any request for permission to hold the society meetings at the hospitals See GLRO H9/GY/A3/3–5 for the Guy's Hospital Minutes; St. Bartholomew's Hospital Archives, Ha 1/14–16 for the Journals Apparently the Middlesex Hospital Society did ask for authorization from its Board of Governors, see Dukes, "London medical societies," p 703

[10] For the laws of the GHPS, see Laws, 1775, *Laws of the Physical Society Held at Guy's Hospital* (London Plummer and Brewis, 1820), Wall, "Guy's Hospital Physical Society," pp. 160–62 The laws of the St. Bartholomew's society have not survived, but from the conduct of the meetings it appears that they were similar to those of Guy's

Identifying those who participated shows how these societies encouraged pupils, practitioners and hospital men to share both their problems and expertise. The cases the members discussed and the papers they presented reveal their disregard for professional boundaries when medical men of diverse backgrounds and status faced the common concerns of practice. Finally, the societies served to reinforce the professional networks which centered on the London hospitals, linking London men to each other and to their provincial colleagues.

The minutes depict a typical meeting of the hospital societies as follows: it is held sometime between October and May, the traditional teaching season. If held at Guy's, it is Saturday night at seven, if at St. Bartholomew's, it is Tuesday at eight. The secretary noted who was in the chair; the names of new members proposed, elected and introduced; a list of books recommended for the library; and, if it was to be a tedious night, some discussion of rules, or revisions to the society's laws. The active part of the evening began with an hour for medical news. Members or visitors described cases, post-mortems, and possible new treatments. They asked for advice on difficult cases and reported on experiments. They also debated the relative merits of competing therapies. After the medical news, one of the members read a paper or re-introduced the previous week's essay, the secretary noting only his name and the topic chosen. Discussion followed until the meeting adjourned.

As the secretaries did not record attendance, it is difficult to know who was present at each meeting. The listing of names of new members introduced, and the usual practice of identifying those who made comments, asked questions, gave cases or presented papers suggest that the probable number who attended ranged from ten to thirty at St. Bartholomew's and from fifteen to forty at Guy's during normal meetings.[11] The formal membership of both societies was much larger, however. Published lists of those belonging to the Guy's Physical Society contain the names of ordinary members, usually pupils or undistinguished practitioners whom the society fined for non-attendance, but by far the largest proportion are honorary and corresponding members, since these latter types of membership could be held for life with no obligation. Although ordinary members could become honorary after giving papers and/or case reports, many established men entered the society with honorary status, other ordinary members simply transferred to corresponding membership when they left London.[12] Both corresponding and honorary members who lived outside of London occasionally attended meetings when they came to town, and sometimes contributed observations from their provincial practice.[13] The minute books are especially valuable for showing who, among the large number of official members, actually came and spoke at the societies, although they cannot reveal the quiet ones who might have equally benefited from the meetings. Furthermore, many of the participants cannot be positively identified, because of common names and fleeting attendance.[14]

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[11] Attendance was highest at the start of the sessions in October, with the influx of new pupils and renewed enthusiasm Both societies were troubled by periods of low attendance See BHMPS, Minutes, 25 March 1800, 13 March 1803, 29 November 1808 The secretary of GHPS occasionally tried to list all of the ordinary members who did not attend, in order to fine them for their absence See, for example, GHPS, Minutes, 12 February 1803, where he listed forty-five ordinary members as absent.

[12] The list of GHPS members published in 1804 gives 54 ordinary, 365 corresponding and 240 honorary members Of these (excluding six clergymen), eighty-five had M D s (13 percent), 134 were listed as surgeons (20 percent) and three were definitely apothecaries, 431 had no professional identification and probably were surgeons, apothecaries, or practicing as both, *Laws of the Physical Society Held at Guy's Hospital* ,

Hospital pupils comprised the single most numerous group of members for both societies, although only a modest proportion of them regularly participated. Most active for long periods of time were the apprentices to the surgical staff at the hospitals, such as William Lawrence and Henry Earle at St. Bartholomew's, Benjamin Travers, Frederick Tyrrell and Thomas Calloway at Guy's and John Flint South of St. Thomas's. Because of their close association with the hospital surgeons, their years of experience with the hospitals and their expectations of eventual hospital appointments, the surgical apprentices formed an elite class among the hospital pupils. Often holding minor posts as demonstrators in anatomy, these apprentices worked hard to make the societies successful by giving papers and frequently contributing case, post-mortem and dissection-room reports.[15]

Like the advanced surgical apprentices, but much less written about in accounts of the period, were physicians' pupils. Men down from Oxford or Cambridge, or on the way to or from a Scottish or a foreign university, took part in the societies while registered as physicians' pupils at St. Thomas's or Guy's, or studying elsewhere in London William George Maton, working in

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to which are annexed a list of the officers and members (London T Cox, 1803), pp 1–29 The list itself is dated 1804 I wish to thank Mr Baster of the Wills Library for allowing me to consult a photocopy of the document held at the Liverpool Medical Institution.

[13] For example, Charles Wingfield (MRCS 1809), an ordinary member of BHMPS from 1807 to 1809 when a pupil at the hospital, visited the society in 1814 and contributed a case report from Oxford, where he practiced. BHMPS, Minutes, 11 October 1814

[14] Unless otherwise noted, identification and biographical information comes from the following sources The standard biographical compilations William Munk, comp , *The Roll of the Royal College of Physicians of London* 2nd ed , 3 vols , (London Longman, Green, 1878), G H Brown, comp , *Lives of the Fellows of the Royal College of Physicians, 1826–1925* (London Longman, Green, 1955), Victor G Plarr, *Plarr's Lives of the Fellows of the Royal College of Surgeons of England*, rev by Sir D'Arcy Power, et al , 2 vols (London Simpkin, Marshall, 1930), Leslie Stephen and Sidney Lee, eds , *Dictionary of National Biography,* 59 vols (New York. Macmillan, 1885–99), and the manuscript pupil registers at St. Thomas's Hospital Medical School Library, Guy's Hospital Medical School and St. George's Hospital Medical School Library

[15] William Lawrence was apprenticed to John Abernethy in 1799, made demonstrator of anatomy in 1801 at St. Bartholomew's and MRCS in 1805 He was extremely active in the BHMPS, giving four papers between 1801 and 1807, as well as innumerable case and dissection reports Henry Earle was apprenticed in 1805 to his father, James Earle, surgeon at St. Bartholomew's from 1784–1815 He delivered five papers to the BHMPS between 1807 and 1812, having given many case reports from the time he entered in 1807 Benjamin Travers, Thomas Calloway and Frederick Tyrrell were apprenticed to Astley Cooper at Guy's in 1800, 1809 and 1810, respectively, the latter two each presenting two papers to the GHPS and all giving case reports John Flint South, apprenticed to Henry Cline in 1814, gave a paper in 1815 and reported on surgical cases in St. Thomas's to the GHPS All eventually acquired hospital appointments On hospital expectations of surgical apprentices, see M. Jeanne Peterson, *The Medical Profession in Mid-Victorian London* (Berkeley University of California Press, 1978), pp 77, 146, on the elite status of apprentices among the hospital pupils, see Frederick G Parsons, *The History of St Thomas's Hospital,* 2 vols (London Methuen, 1934), 2 250

London for his Oxford M.D. of 1801, contributed to Guy's Physical Society in 1798. George Rees, who took a Glasgow M.D. in 1801, registered as a physician's pupil at St Thomas's in 1795 and participated in both the St. Bartholomew's and the Guy's societies while he studied in London and after he returned from Scotland with his degree. Clement Hue regularly joined in the St Bartholomew's society meetings while a pupil at the hospital from 1800 to 1802, before going up for his 1807 Oxford M.D. John Elliotson and Richard Bright both attended St. Thomas's hospital as pupils and Guy's Physical Society as ordinary members before getting their Edinburgh M.D.s in 1810 and 1812, respectively. As a last example, Isaac Buxton returned to London with an 1802 M.D. from Göttingen, registered as a physician's pupil at Guy's that same year and energetically brought cases to the Guy's society from 1803 to 1808.

The rest of the pupils signed up at the hospitals for practice or lectures under the surgeons, physicians or hospital apothecaries. Many were in London for a year or less; those who stayed longer, particularly pupils who served as dressers and house surgeons, often attended meetings for one to three years before leaving London for provincial or military practice. For example, W. P. Lecocq, from Guernsey, attended St. Thomas's Hospital as a pupil and then as a dresser to Henry Cline, Sr., from 1804 to 1806, and gave papers at the 1804–5 and 1805–6 sessions of the Guy's Physical Society. The records for pupils at St. Bartholomew's are fragmentary, but a partial list from 1807 to 1814, together with the minute books, shows that thirteen of the fourteen house surgeons at the hospital belonged to the St. Bartholomew's Medical and Philosophical Society, and nine of them gave papers during their years there[16] The societies clearly attracted pupils dedicated to their London training.

While pupils were the more numerous group of members, practitioners were the more active and generally more long-standing participants. Those medical men in private practice in London without any particular association with a hospital are particularly difficult to identify precisely Such men worked as surgeons, apothecaries or *de facto* general practitioners Mr Thomas Walshman, for example, who had studied at St. Thomas's and Guy's hospitals and was a general practitioner in Southwark, spent many years as an active member of Guy's Physical Society. After he took his M.D. in 1801, he continued as Dr. Walshman, both in his local practice and faithful membership in the society.[17] Samuel Cooper, MRCS 1805, studied at St. Bartholomew's before he qualified, and participated in the hospital society from

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[16] The only pupil records I have been able to find are in the Private Diary of Ludford Harvey, who kept track of pupils and dressers at St. Bartholomew's when he was a full surgeon there from 1807 to 1824 He kept these notes primarily for financial reasons, since he shared the pupils' fees with the other surgeons The manuscript is now held in the St. Bartholomew's Hospital Archives I wish to thank the archivist, Janet Foster, for bringing this uncatalogued manuscript to my attention.

[17] Munk, *Roll*, 3 56 states that Walshman received his M D from Glasgow in 1807, but the secretary of GHPS began calling him "Dr" in 1801, GHPS, Minutes, 2 May 1801

1803 to 1810. He gradually established a large surgical practice in London and became known as a medical writer.

Hospital men, including men from the host hospitals, participated in, and at times dominated, the weekly meetings. John Abernethy, for example, occasionally treated the St. Bartholomew's society as an extension of his lecture theater. He especially tended to bring up cases which illustrated and confirmed his particular views on the interrelationship between local disease and constitutional irritation. He believed that most constitutional conditions arose from local derangements, particularly of the digestive organs, and strongly recommended attention to diet and general health when treating any illness, whether medical or surgical Abernethy made these points repeatedly to the society, in his published works and in his lectures on surgery.[18]

Doctors Richard Powell and James Haworth, both physicians to St. Bartholomew's Hospital, also chaired society meetings, entered discussions and brought up cases from their practices. The Guy's society drew upon the staff of both Guy's and St. Thomas's hospitals, with Astley Cooper the most active participant from amongst the surgeons and Doctors William Babington, James Curry, George Currey, Henry James Cholmeley and James Laird from the physicians. Richard Stocker, the Guy's Hospital apothecary, also contributed for several years. Added to this distinguished group were physicians from other hospitals and dispensaries, notably Dr. Thomas Bradley, physician to the Westminster Hospital, who belonged for a time to both societies, Bryan Crowther, surgeon to Bridewell Hospital, active in the St. Bartholomew's society; and Dr. George Birkbeck, physician to the General Dispensary in Aldersgate Street from 1807, in the Guy's society. Finally, although not staff members of the hospitals or dispensaries per se, several medical, surgical and scientific lecturers often contributed, such as Dr. John Haighton, who lectured on physiology and midwifery at Guy's, William Allen, a non-medical man who lectured on chemistry, also at Guy's and James Macartney, a surgeon who lectured on comparative anatomy at St. Bartholomew's.[19]

A third group of practitioners might be called "the hopefuls" because all of these men tried to join the staff of a London hospital. Analysis of the membership lists and the hospitals' Courts of Governors minutes shows that a good number of hospital men did not win their positions easily. Many of the hopefuls often spent years practicing in London, maintaining contact with the hospitals in part through their active involvement in these societies, while running for staff elections as they arose. For example, Dr. Clement Hue returned to London with his Oxford M.D in 1809 and participated in the St. Bartholomew's society until at least 1814; he had to wait until 1823 for a physician's post to open in the hospital, but finally obtained a staff position. Doctors James Laird, John Elliotson, James Haworth, Alexander Marcet and the surgeon Benjamin Travers all ran for hospital appointments at least once without success before their ultimate elections, and all belonged to the St. Bartholomew's or Guy's societies while establishing themselves.[20] The men who failed to win posts at Guy's, St. Thomas's or St. Bartholomew's hospitals sometimes ended up with positions at other hospitals or dispensaries. For example, Dr. John Yelloly, who tried for a Guy's post in 1802 and 1804 and for a St. Thomas's one in 1802 as well, managed to become physician to the London Hospital in 1807.[21] Finally, several other physicians and surgeons who belonged to the societies also tried for London hospital posts, but eventually gave up. John Whitfield, member of the Guy's society and a London surgeon, petitioned in 1790, 1799, and again in 1800 for a surgeon's post at Guy's. Dr. James Tattersal, with an 1811 Oxford M.D., put himself forward for assistant physician at Guy's in 1811, 1813 and 1819 and then apparently retired to a provincial practice.[22]

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[18] See, for example, BHMPS, Minutes, 20 October 1801, 17 November 1801, 1 March 1803, 11 October 1806, 14 October 1806, 13 October 1807, 12 October 1814 Abernethy's published opinions have appeared in a variety of editions, such as *The Surgical and Physiological Works of John Abernethy,* 2 vols (London Longman, Hurst, Rees, Orme and Brown, 1825) See especially his "On the Constitutional Origin, and Treatment of Local Diseases," *idem,* 1 9–144, which appeared in an earlier form in 1804, George Macilwain, *Memoirs of John Abernethy* (London Hatchard, 1856), pp 128ff, 220

[19] On John Haighton, see Samuel Wilks and George T Bettany, *A Biographical History of Guy's Hospital* (London. Ward, Lock, Bowden, 1892), pp 363–65 For further information on James Macartney, see John L. Thornton, "A diary of James Macartney (1770–1843) with notes on his writings," *Med Hist*, 1968, *12* 164–73

As Dr. Yelloly's eventual connection with the London Hospital suggests, the membership lists of both societies show that they served much more than individual hospital communities. Throughout this period, a number of pupils and practitioners went to meetings of both the Guy's and St. Bartholomew's societies, including William Lawrence, James Macartney and Doctors Robert Gooch, Richard Williams, Robert Thornton and George Rees. Moreover, internal evidence reveals that several student members were studying at other major London hospitals where no known medical societies existed. Among these were Kennedy, Watkins and Wooley from St. George's Hospital, Anthony White, an apprentice at the Westminster Hospital, Pugsley from the London Hospital and Benjamin Brodie, when a pupil at the Great Windmill Street School. Practitioners were also connected to other London societies, both medical and scientific, and so further linked the hospital groups to the broader network of intellectual and professional activity. Local and hospital practitioners belonged, for example, to the Medical Society of London (1773) and to the Medical and Chirurgical Society (1805).[23] Similarly, several participated, sometimes quite actively, in a variety of scientific groups, from the official and prestigious Royal Society to the informal and short-lived Askesian Society.[24]

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[20] Names of unsuccessful candidates, whether they withdrew before the election or went to ballot, appear in the hospital records See Minute Book of the General Court, Guy's Hospital, 1725–1815, GLRO H9/GY/A1/1/1, Minutes of the Court of Governors, St. Thomas's Hospital, 1784–1849 GLRO H1/ST/A1/8, Journal of the Board of Governors of St Bartholomew's Hospital, 1786–1801 (Ha 1/15), 1801–1815 (Ha 1/16) Most of the St. Bartholomew's election details are also given by Moore, *St Bartholomew's*, 2 passim Competition for physicians' posts dominated this period because there were relatively few vacancies for assistant or full surgeons

[21] Yelloly had become physician to the General Dispensary, Aldersgate Street, in 1801 and was clearly trying to improve his professional status by moving to a hospital post. James J Abraham, *Lettsom His Life, Times, Friends and Descendants* (London Heinemann, 1933), p 165 Other examples are Drs Isaac Buxton and Sayer Walker

[22] Other examples of society members who failed to win hospital posts are Dr Robert John Thornton, Dr William Moore, William Norris, and Daniel Gibb

We can better understand the activities of the hospital societies by keeping the complexity of the membership in mind. Those who attended and participated obviously had a wide range of goals and expectations The pupil passing through on the way to a military career or a quiet provincial practice might have been content to listen. The ambitious pupil or practitioner, however, would have been far more eager to attract attention with cases and papers.

As mentioned above, each meeting had two parts. that devoted to medical news and an hour reserved for a paper. Both sections illustrate the interests and concerns of the members. An average of eight papers a season were given to each society (see Table 1) and although only the authors and topics are known, the lists yield the following conclusions. First, the basic interests did not change. Hernia, dropsy, digestion, fevers, consumption, rheumatism, aneurisms, head injuries, venereal disease, and the like, remained standard fare for paper topics during the entire period The major, and not surprising, exception to this is vaccination, which became an issue in 1798–99 in both societies and attracted regular attention from the members for the next ten years. Second, in addition to the papers which reflected a primary interest in patient care, were those which showed that the members enjoyed comparative anatomy, medical chemistry, human physiology and occasional excursions into the definition of life (see Table 2). Nor did the speakers restrict themselves to topics and authors exclusively British. In 1808, for example, Samuel Barnes, a former house surgeon at the hospital, delivered a paper on the "System of Bichat," which the St. Bartholomew's society discussed for three consecutive meetings.[25] Third, while most of the

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[23] "List of the members 1789," *Mem Med Soc Lond*, 1787, *1* n p , Of the list of Medical and Chirurgical Society members given for 1805–9 in the *Med Chir Trans*, 1809, *1* ix–xiii, twenty of the ninety-eight belonged to the GHPS, and one (John Abernethy), belonged to the BHMPS

[24] Fellows of the Royal Society in the hospital societies during this period included John Abernethy, Astley Cooper, William Lawrence, Benjamin Travers, Alexander Marcet, and William Saunders—all men with established reputations. Joint membership between the GHPS and the British Mineralogical Society (1799–1806) has been noted by Paul Weindling in his article "The British Mineralogical Society A Case Study in Science and Social Improvement," in Ian Inkster and Jack Morrell, eds , *Metropolis and Province Science in British Culture, 1780–1850* (Philadelphia University of Pennsylvania Press, 1983), pp 145–46, n 16 The joint members included William Allen (also a member of the BHMPS), Martin Tupper (probably also a member of the BHMPS), Richard Stocker and Dr William Babington A similar overlap occurred with the Askesian Society See Ian Inkster, "Science and society in the metropolis a preliminary examination of the social and institutional context of the Askesian Society of London, 1796–1807," *Ann. Sci*, 1977, *34* 21, Weindling, "British Mineralogical Society," pp 142–43 Much further research needs to be done on the membership of many other London societies, such as the Linnean Society and the London Philosophical Society, to see how medical men participated in them How much they pursued science as a necessary adjunct to medicine and surgery, as a separate hobby or avocation or with hopes of further social mobility and professional connections, remains to be investigated.

[25] BHMPS, Minutes, 11 October to 1 November 1808 Note that neither Table 1 or 2 includes the submissions for the prize essays set annually by the GHPS The response to the prize questions was sporadic, and

Table 1 Number of Papers Given to the Societies, per Year

	St Bart's	Guy's		St Bart's	Guy's
1795–96	—	4	1806–07	9	9
1796–97	—	5	1807–08	12	9
1797–98	—	3	1808–09	3	10
1798–99	—	5	1809–10	9	14
1799–1800	9	3	1810–11	11	11
1800–01	7	5	1811–12	10	9
1801–02	9	6	1812–13	5	9
1802–03	11	7	1813–14	8	13
1803–04	6	8	1814–15	10	10
1804–05	6	5	1815–16	—	10
1805–06	10	12			
			TOTALS	135	167

papers were student exercises, some provide evidence of long-standing research interests, the subjects later appearing in the members' publications. For example, in 1800, James Macartney delivered a paper, entitled "On the Production of Light in Insects," which probably contributed to his 1810 essay for the Royal Society on luminous animals.[26] Finally, the selection of paper topics had no obvious correlation with the identification of surgeons', physicians' or apothecaries' pupils. Surgical pupils examined diabetes and consumption, just as future M.D.s took hernia and head injuries as dissertation subjects.[27] Similarly, all types of practitioners explored physiological questions, since topics like animal heat or definitions of life had no professional boundaries.[28]

An analysis of contributions to medical news reveals similar conclusions. While local practitioners and hospital men tended to present their difficult cases, especially those requiring operations, such as hernia, aneurisms and skull fractures, they also brought up problems of everyday practice, such as venereal disease, difficult labor, consumption, fever and burns.[29] The soci-

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the answers received were not always read to the society Most of the prize essay topics were in medicine, surgery or physiology

[26] BHMPS, Minutes, 16 December 1800, with discussions continued on 30 December 1800, and 13, 20, 27 January 1801 James Macartney, "Observations on luminous animals," *Phil Trans*, 1810, *100* 258–93 William Lawrence revealed his early interest in man with a paper "On the Varieties of the Human Species," given to GHPS on 8 January 1802 and to the BHMPS on 4 October 1803 The same subject formed part of his lectures on the Natural History of Man given to the Royal College of Surgeons in 1818 See his *Lectures on Physiology and the Natural History of Man* (Salem Foote and Brown, 1828), pp 212–33 See also Bransby B Cooper, *The Life of Sir Astley Cooper, Bart*, 2 vols (London John W Parker, 1843), 1 107

[27] For example, Dr Barry gave a paper on crural hernia (GHPS, Minutes, 20 February 1813), Clement Hue presented a paper on gangrene (BHMPS, Minutes, 8 January 1802), John Sver, surgeon, read a paper on phthisis pulmonalis (BHMPS, Minutes, 22 February 1803)

[28] For example, R W Brown, a surgical pupil and MRCS 1811, and Dr Robert Gooch both gave papers on animal heat, BHMPS, Minutes, 19 February 1811, and GHPS, Minutes, 25 April 1808, respectively

[29] Examples of cases reported to the GHPS have been published by Wall, "Guy's Hospital Physical Society," pp 165–67 and Campbell, "History of the Physical Society," p 112 These authors both chose unusual cases to illustrate the society's business, the normal case reports are similar to those published in the contemporary medical press

Table 2 Number of Papers Delivered to the Societies (1795–1815), by Subject

	St. Bartholomew's		Guy's		TOTALS	
Surgery	50	(38.2%)	48	(28.7%)	98	(32.9%)
Medicine	41	(31.3%)	54	(32.3%)	95	(31.9%)
Physiology	11	(8.4%)	24	(14.4%)	35	(11.7%)
Therapeutics	7	(5.3%)	9	(5.4%)	16	(5.4%)
Chemistry, Natural Philosophy and Natural History	6	(4.6%)	12	(7.9%)	18	(6.0%)
Venereal Disease	4	(3.1%)	7	(4.2%)	11	(3.7%)
Midwifery, Diseases of Women	2	(1.5%)	6	(3.6%)	8	(2.7%)
Eye Diseases	3	(2.3%)	1	(0.6%)	4	(1.3%)
Other	7	(5.3%)	6	(3.6%)	13	(4.4%)
Subject Not Given	4		0		4	
TOTALS	135	(100%)	167	(100%)	302	(100%)

eties particularly encouraged pupils at all levels to describe cases they had observed during the ward rounds in 1813, for example, the members of Guy's Physical Society decided "that the Dresser for the week (being a member of the Society) should be requested to furnish whatever may fall under his observation interesting to the Society."[30] House surgeons, because they had more responsibility for patients and more opportunities for close observation, were especially eager to share their experiences.[31]

During this twenty-year period, both societies also encouraged their members to prepare more detailed case histories. In Guy's Physical Society, the process appeared formally in 1801, when the Common Committee decided that one of the papers required for a member to rise from ordinary to honorary status could be replaced by two written case reports. To qualify, the report had to contain details of treatment and a comparison with accounts of similar conditions, which it was hoped would provide insight into the efficacy of the remedies used. If the case ended in death, and a dissection was possible, the society expected post-mortem details.[32] The criteria were not just empty standards: in 1804, the committee at Guy's ruled that "Two cases were read but being unaccompanied with any observations & thereby deficient in the end proposed were returned to the Author."[33] By 1811 in both societies, case reports from ordinary members were often quite detailed and the secretary at St Bartholomew's noted—with a hint of boredom—that certain individuals went on "at length."[34]

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[30] GHPS, Minutes, 4 March 1813, resolved by the Common Committee, the group which served as an executive committee of the society. This passage is also quoted by Campbell, "History of the Physical Society," p. 113 as a resolution passed by the Society on 6 March.

[31] Eight out of the fourteen known house surgeons at St. Bartholomew's Hospital from 1807 to 1814 repeatedly gave case reports to the BHMPS during their house surgeon appointments. These included Joseph Lightfoot, John Ashburner and John Webb.

[32] GHPS, Minutes, 3 October 1801.

[33] GHPS, Minutes, 2 February 1804.

The cases, questions, observations, and problems brought up by the members show that they were not simply contributing to academic or theoretical discussions. Inconsistent treatments, decisions to operate, and proper diagnoses of conditions were pressing and immediate concerns for both students and practitioners. In 1807, Mr. Wood, a pupil at St Bartholomew's, plaintively asked the society how one could really tell if a fetus was alive or dead in the womb, referring to the descriptions in textbooks as useless. Abernethy responded with the disquieting, but honest, assessment that the whole condition of pregnancy was obscure; there were no easy answers to his questions.[35] As pleased as the members could be with their cures or their positive reports of individual cases, they were often frustrated with the work they were doing and skeptical of smooth assertions and easy answers. James Macartney warned against accepting the claims practitioners often made about the efficacy of mercury in a wide variety of conditions. He noted that because other treatments, especially bleeding, were also routinely given, there was no certainty that mercury caused the perceived improvements. Such haphazard "experiments" ended with the "truth left vacillating."[36]

Those who reported on post-mortems frequently expressed frustration with the lack of correlation between symptoms and morbid anatomy. Most examinations turned up something more or less expected to explain the patient's condition, but others only left the cause of symptoms and death more obscure. There were apoplexies and madness with no sign of disease in the brain; a series of fevers with inexplicably enlarged spleens; sudden deaths due to aortic aneurisms; and the coincidental discoveries during post-mortems of organic diseases which had produced no symptoms or complaints in the living patients.[37] Added to these experiences, about which members could only report and not explain their observations, were difficulties with patients who managed to leave the hospital before dying, thus escaping examination, as well as resigned summaries of private cases where the family refused permission to open the body.[38]

Finally, practitioners reported on experiments ranging from rough clinical trials to investigations with animals and chemical analyses. In 1796, for example, Abernethy, then an active member of Guy's Physical Society, described experiments conducted at St. Bartholomew's on phthisical patients. The use of various gases for treating lung diseases was a controversial issue during the late eighteenth century, and the medical men at St. Bartholomew's set up a chamber to try the effectiveness of hydrogen gas as a treatment for consumption. Abernethy noted that the patients felt some immediate relief, because of diminished cough and expectoration. He did not recommend the treatment, however, because he could not "conceive it capable of removing Tubercles, actual Thickening, or any long-standing disease of the lungs."[39]

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[34] BHMPS, Minutes, 12 February 1811, 12 March 1811, 7 January 1812 Longer case reports are also notable from the pupils at Guy's, especially in the period 1812–13 Several cases reported to the hospital societies were also given to other medical societies, and eventually appeared in print For example, Isaac Buxton reported to GHPS on a case of poisoning by charcoal fumes on 20 December 1806 On 7 January 1807, William Babington read the details of the case to the Medical and Chirurgical Society "A case of exposure to the vapour of burning charcoal," *Med Chir Trans*, 1809, *1* 83–98 The local practitioner, Mr Hingeston, who consulted Babington on the case, was a member of GHPS

[35] BHMPS, Minutes, 13 January 1807

[36] BHMPS, Minutes, 17 February 1807

[37] GHPS, Minutes, 3 November 1804, 25 February 1808, 31 March 1810, 16 October 1813, 21 October 1815, BHMPS, Minutes, 31 December 1799, 25 November 1800, 17 March 1801, 21 April 1801, 6 October 1801, 12 January 1802, 25 October 1803, 10 December 1805, 17 November 1807, 30 January 1810, 6 February 1810, 15 December 1812, 14 December 1813, 18 October 1814 For dissecting room reports, see, for example, BHMPS, Minutes, 30 January 1810, 20 December 1813, GHPS, Minutes, 30 March 1805, 25 February 1809

[38] For example, BHMPS, Minutes, 3 April 1810, 10 November 1812

Practitioners and students used animals for experimentation on "clinical" questions. In 1802 Mr. King reported to Guy's on experiments he had performed on rabbits to test the hypothesis that hydrogen gas might help in restoring drowned persons. He drowned several rabbits and satisfied himself that those given hydrogen gas died, while those treated the usual way by resuscitation recovered. Probably in a response to a discussion of post-mortem artifacts, Joseph Hodgson, a former St. Bartholomew's pupil and, in 1813, a surgeon in London, gave the St. Bartholomew's society the results of experiments he had done on rabbits to confirm the self-digestion of the stomach after death. He was also happy to disprove Joseph Adams's assertion that self-digestion and stiffening of the limbs did not occur together.[40] Most of the chemical investigations dealt with the materia medica, as in the production of gases, acids, or plant extracts of therapeutic value. Other practitioners hoped that chemical tests might have some physiological or pathological value and reported on items like the chemical analyses of variolous matter and of fluid from hydroceles.[41] Despite the undoubted interest in scientific work, the societies did not actively encourage medical research beyond showing a willingness to hear and discuss what the members presented. The complexities of practice took precedence over questions of medical or scientific theory. The only live demonstrations the members viewed were not chemical experiments, but anatomical or pathological preparations and the occasional patient.[42] Furthermore, practitioners who did advanced work on physiological, botanical, or chemical questions were much more likely to present it to the more appreciative audiences in scientific societies or in publications. For example, Alexander Marcet and John Haighton did not present much of their respective chemical and physiological research to the Guy's Physical Society.

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[39] GHPS, Minutes, 24 December 1796 For other clinical trials, see GHPS, Minutes, 28 October 1797, 1 April 1797, 25 February 1809

[40] GHPS, Minutes, 23 April 1802, BHMPS, Minutes, 10 November 1813 See also GHPS, Minutes, 22 March 1794, BHMPS, Minutes, 10 March 1807

[41] GHPS, Minutes, 19 December 1795, 27 December 1806, BHMPS, Minutes, 15 October 1799, 3 January 1802, 16 February 1802, 9 March 1802, 16 November 1802, 9 October 1804, 29 October 1805 The interest in chemistry, natural philosophy and natural history definitely took second place to debates on therapeutics and case reports The members did not actively promote either individual or joint experimentation.

[42] BHMPS, Minutes, 27 October 1807 The Society adjourned early so the members could view an accident victim in the hospital, see also GHPS, Minutes, 30 December 1797

The societies also remained apparently oblivious to the renewed calls for medical reform which began to stir London and the provinces around 1800.[43] While informal discussion on reform might have occurred before or after the meetings, political debates were just not part of the societies' business. Whatever formal barriers or jurisdictional complaints separated physicians, surgeons, and apothecaries in ultimate allegiance, many types of practitioners, from Fellows of the Royal College of Physicians to local surgeon-apothecaries, came together amicably on Tuesday and Saturday evenings.[44] Their discussion of a wide range of topics and cases, with mutual respect for differing opinions, indicates that while certainly not all practiced as general practitioners, most of them had the general practitioner's interest in, and understanding of, both medical and surgical problems.[45] Although the traditional and increasingly political distinctions between the ranks shaped the London medical profession in the early nineteenth century, it should be remembered that patient care, pragmatic interests and personal friendship also tied these men together. Such connections probably complicated the tortuous path of medical reform before 1858.

Historians of scientific societies in late eighteenth- and early nineteenth-century Britain have repeatedly noted that such groups brought men of similar and divergent social positions together through their mutual interests.[46] The members of the Guy's Physical Society and the St. Bartholomew's Medical Society were similarly constituted and motivated. The societies provided a setting in which local practitioners, whose families and clientele were among shopkeepers, small tradesmen, and others of the lower middle class, could meet with the hospital men, such as William Babington, John Abernethy and Astley Cooper, whose social place was comparable to that of their wealthier private patients, to share observations from their diverse practices. With this association came the benefits of knowing how other men dealt with specific medical and surgical conditions, and of hearing about and questioning the success or failure of new treatments and operations. The hospital societies share two other important features of their scientific counterparts: as vehicles for an "image" of a body of knowledge, in this case an implicit organization of London medical practice, and as avenues for personal advancement, especially professional mobility.[47]

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[43] S W F Holloway, "The Apothecaries Act, 1815 a reinterpretation, part I," *Med Hist*, 1966, *10* 107–29, Peterson, *Medical Profession,* pp 20–21 For contemporary notice of the reform movement, in addition to the material cited by Holloway, see *Edin Med Surg J*, 1806, *2* 252–53, 489–90, 1807, *3* 119, 250–52

[44] On the presumed division and isolation of the physicians, surgeons, and apothecaries, despite the rise of the general practitioner, see S W F Holloway, "Medical education in England, 1830–1850 a sociological analysis," *History,* 1964, *49* 301, 307, Peterson, *Medical Profession,* p 12 For the important practical and political shift to general practitioners and consultants, see Ivan Waddington, "General Practitioners and Consultants in Early Nineteenth-Century England The Sociology of an Intra-Professional Conflict," in John Woodward and David Richards, eds , *Health Care and Popular Medicine in Nineteenth-Century England* (London Croom Helm, 1977), pp 164–88

[45] For such debates in the societies see, for example, BHMPS, Minutes, 8 October 1799, 17, 24 February 1801, 6 October 1801, 3 November 1801, 2 February 1808, GHPS, Minutes, 3 December 1796, 30 April 1808

[46] For example, see Robert E Schofield, *The Lunar Society of Birmingham* (Oxford Clarendon Press, 1963), p 3 Jack Morrell and Arnold Thackray, *Gentlemen of Science Early Years of the British Association for the Advancement of Science* (Oxford Clarendon Press, 1981), pp 22–23, Morris Berman, *Social Change and Scientific Organization The Royal Institution, 1799–1844* (Ithaca Cornell University Press, 1978), chap 1

During this period, hospital men sought to maintain and increase their control over medical education within the hospitals and to strengthen their professional eminence within the community.[48] The hospital societies, by confirming the importance of the London hospitals as centers of on-going medical debate and progressive practice, increased the dominant role and prestige of the London hospital men. The hospital men drew on their considerable experience with hospital and private patients and their professional connections with the wider London medical elite, especially other hospital practitioners, to establish their authority on theory and practice. While these men expected deference during the societies' meetings, they never came across as rigidly narrow or dogmatic. They welcomed the comments, questions, or suggestions which pupils or other practitioners offered on diagnosis and treatment. This combination of reasonable open-mindedness and broad experience probably reinforced the head-of-the-profession image which the hospital men sought and helped to impress it upon a most important audience, the next generation of practitioners and colleagues.

As well as the knowledge and experience which pupils and practitioners acquired by attending meetings, they also used the societies to establish beneficial professional relationships with the hospital staff and to improve their prospects of obtaining hospital and dispensary posts. As noted above, several physicians and surgeons were active in the societies while seeking staff elections. Whatever their immediate personal reasons for joining the societies, these practitioners could also have hoped to gain a competitive advantage by becoming known to the hospital hierarchy and by indirectly learning the hospital routine, including the specific opinions and practice of the current staff. Even former physicians' pupils and surgeons' apprentices, already favored for new openings, used the weekly meetings, at least in part, to keep in touch with their influential masters and to demonstrate their continued interest in hospital medicine.

For the local practitioner with no chance at a charity post, the connection with hospital men helped by opening possibilities for referrals of private patients. Pupils who became corresponding members also used the societies for professional ends, particularly to maintain contact with their London teachers and colleagues, by writing letters with their medical news, and attending the meetings when in town. Furthermore, the local men often called in the hospital men for consultations on their own better paying patients, an arrangement that the camaraderie of the societies could foster for both intellectual and professional rewards.[49]

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[47] For scientific societies as embodiments and proselytizers of changing images of science and its practice, see Berman, *Social Change*, pp xx–xxi, Robert H Kargon, *Science in Victorian Manchester* (Manchester Manchester University Press, 1977), chap 1, esp pp 27–33 As avenues of social mobility, see Inkster, "Science and society" and Weindling, "British Mineralogical Society" Note that I am not specifically concerned here with the image of science which the hospital societies portrayed, nor with their roles for social mobility, which usually, however, contributed to and depended upon professional status

[48] Peterson, *Medical Profession*, p 63, Waddington, "General Practitioners and Consultants," pp 170–73 The efforts of hospital men to control education within the hospitals has been emphasized for the 1820s and 1830s It actually began in the mid-eighteenth century, I am currently working on a detailed study of London medical education from 1750 to 1815

Finally, and in this respect unlike their scientific counterparts, the hospital societies played a direct role in medical and surgical education. As is the case with most educational opportunities, how much a student learned from a society depended upon his own initiative. At a minimum a pupil could at least watch his peers and masters in action. For the pupil who participated, however, the advantages multiplied. Visibility certainly brought subtle professional benefits, such as a stronger letter of introduction when attempting to develop a provincial, military, or London practice. But presenting case histories had a further concrete value From the early eighteenth century, medical men had increasingly stressed the importance of clinical observations: of learning, when confronted by a patient, how to disclose his history and to gather the information needed for diagnosis, prognosis, and treatment Most medical and surgical writers emphasized that the variety of cases and the chance to observe well-qualified men made hospital experience important for both medical and surgical training. A partial drawback, however, was the relative isolation of the majority of hospital pupils in London who did not have the privileged status of the apprentice or the responsibility of the dresser. They attended, they observed—but they were rarely examined on what they observed or required to discuss cases with a senior. Hence many of the students came and went with little trace of formal teaching or examination by those whom they had paid to see.[50] Thus it is clear why the pupils who participated in the societies could have benefited so directly from their experience. Bringing up a case observed at the bedside gave the courageous pupil a chance to receive the questions and responses

[49] Waddington, "General Practitioners and Consultants," p 171, For an implicit referral of a former hospital patient requiring further care to a young pupil/practitioner, see BHMPS, Minutes, 7 December 1813 See also notes 13, 34 above For further indirect evidence of connections established and/or supported by mutual membership in the societies, see, for example, William Lawrence, "Observations on lithotomy," *Edin Med Surg J*, 1809, *5* 142 Lawrence was assisted in a private case by Bryan Crowther, a member of BHMPS from 1801 See also Alexander Marcet, "A case of hydrophobia," *Med Chir Trans*, 1809, *1* 153–54, Marcet refers to several other practitioners who were active in the GHPS Eliot Freidson has emphasized the importance of personal networks for referrals in modern medicine, his comments, with obvious qualifications about the structure of practice, seem equally appropriate for the early nineteenth century *Profession of Medicine A Study of the Sociology of Applied Knowledge* (New York. Dodd, Mead, 1971), pp 94–96, 193–96

[50] Peterson, *Medical Profession*, p 14 Note that the first requirement for hospital practice existed only from about 1810, when the Royal College of Surgeons asked for "hospital attendance" for the diploma Resolutions of the Court of Examiners of the Royal College of Surgeons, vol 1 (1763–1824) 15 June 1810, Zachary Cope, *The Royal College of Surgeons of England* (London A. Bland, 1959) has dated the requirement from 1813, when, in fact, the Court decided to demand one year's attendance, see Resolutions, 6 August 1813 The Society of Apothecaries did not require hospital attendance until 1815

of senior pupils and hospital men.[51] Furthermore, asking questions during the general discussions clarified how theoretical principles presented in lectures applied to actual cases. While the society meetings could not take the place of clinical lectures or practice, they certainly supplemented passive hospital teaching with animated discussions in which the student could test himself.

Guy's Hospital Physical Society and St. Bartholomew's Hospital Medical and Philosophical Society served important educational and professional functions in London between 1795 and 1815. They provided the opportunity for discussing everyday problems, sharing new discoveries and encouraging pupils to exploit fully their hospital experiences. They allowed hospital men to pontificate at times, but also to support the efforts of local practitioners and ambitious students. While not improving medicine in the sense of directing research or organizing clinical investigations, they did help medical men at all levels to think about their experiences before their observations were lost in the demands of the next case Perhaps most important, the societies fostered the medical communities associated with three of the great London hospitals. They did this by providing links between pupils and practitioners from different hospitals, different kinds of practice, and different professional levels.

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[51] As an anonymous pupil wrote home ca. 1793–1800 about the GHPS and the papers discussed, " this is a very agreeable amusement, and gives an opportunity for those who have confidence enough to display their abilities" Quoted in Parsons, *St Thomas's,* 2 251 For evidence that the pupils recorded at the bedside the cases that they gave to the society, see GHPS, Minutes, 22 February 1800, 28 February 1807, 5 March 1814, BHMPS, Minutes, 25 February 1800, 12 February 1801, 15 October 1805, 18 December 1810

TEXTS AND DOCUMENTS

AN UNPUBLISHED LETTER FROM MARCELLO MALPIGHI*

Annotated and translated by
W. E. Knowles Middleton

In the Woodward Library at the University of British Columbia there is a manuscript, shelf mark Q113 B67, which consists of three small volumes, bound as two, entitled *Opere inedite di Gio. Alfonso Borelli delle Scuole Pie.* This is evidently a copy, most probably made by one of the Piarist Fathers, of papers left behind by Borelli (1608–79), who passed his last days at the monastery of San Pantaleo in Rome, the headquarters of the Order. (Borelli was not himself a cleric.) The original papers have long since disappeared.

In the third volume, fol. 79r-v, there is a copy of a letter from Marcello Malpighi (1628–94), then at Bologna, to Giovanni Alfonso Borelli at Pisa, dated 16 March 1661. This was at the time when Malpighi was making his remarkable observations of the lungs of various animals, published in the same year.[1] There was a great deal of correspondence between the two men on this subject at the time,[2] of which many of Borelli's letters have survived, but very few of Malpighi's[3] These were probably lost when Borelli had to escape from Messina, for political reasons, in 1674.[4] It is quite clear that at this time Malpighi looked to the older man for advice and encouragement.[5]

The letter presented below is almost certainly the one referred to in Borelli's letter of 24 March 1661,[6] which begins: "Ricevo questa settimana la Sua gratissima del 15 coll' incluso modello della seconda Sua epistola, la

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[*] I wish to acknowledge the kindness of Professor John Norris in criticizing the draft of this paper

[1] Marcello Malpighi, *De pulmonibus observationes anatomicae* (Bologna. B Ferroni, 1661) Also in *Opera omnia* (London Robert Scott and George Wells, 1686) See also Marcello Malpighi, *De pulmonibus,* trans and ed. Luigi Belloni (Messina and Palermo Società italiana di Istochimia and the Congressi nazionali di Anatomia e di Medicina Interna, 1958)

[2] See Howard B Adelmann, *Marcello Malpighi and the Evolution of Embryology,* 5 vols (Ithaca, NY Cornell University Press, 1966), 1 chap 7, pp 165–202

[3] Howard B Adelmann, ed , *The Correspondence of Marcello Malpighi,* 5 vols (Ithaca, NY Cornell University Press, 1975) The letters of Borelli to Malpighi are in volume 1

[4] For a life of Borelli, see the excellent article by Thomas B Settle in *Dictionary of Scientific Biography,* 2 306–14

[5] This is made evident by Adelmann, *Malpighi and Embryology,* 1 chap 7, pp 165–202, and also by the surviving correspondence

[6] Adelmann, ed , *Correspondence of Malpighi,* 1 letter 41, pp 80–83

quale ho ammirato per le meraviglie, che ella contiene."[7] I cannot account for the one-day discrepancy in the date. The "modello" is copied next (fols. 80r-82v) in the Woodward library manuscript, and is almost word for word the same as the second published letter of the two that form the *De pulmonibus.* The copyist noted (fol. 79v) that he found the two together, and also another, which turns out to be the first letter of the *De pulmonibus,* and precedes the letter under consideration in the manuscript. He also found another copy of the second letter with a different first paragraph, the presence of which in Borelli's papers remains a mystery. Moreover, there was a printed copy, "come si legge presso Bartholini, *De pulmonibus substantia et motu diatribe*"[8]

This hitherto unknown letter fills a gap in the correspondence between the two men about Malpighi's work on the lungs.

TEXT[9]

Molto Ill:re ed Ecc·mo Sig·re e Pne Colend:mo Mentre io ero distendendo l'inclusa lettera ho ricevuta una Sua cortese, dalla quale intendo i motivi, che di nuova La sollecitano a non fare una epistola, come anche le ragioni, che soggiugne accioche io moderi i miei primi concetti con una seconda epistola, e benche nell'ultima mia io mi sii mostrato renitente a ciò fare, ora dalle cose osservate come vedrà son prontissimo, e debbo a Lei non ordinariamente, che con si gran cortesia m'instruisce, e mi difende

Questa settimana, e non prima ho potuto aver rane, e mentre io cercava la sostanza de' pulmoni con un microscopio a gran fatiga, e pazienza al sole, o lume ho ritrovato ciò che è inserito nell'epistola, e non credo sia stato da altri osservato, e mi pare sia di gran conseguenza. VS si compiacierà di considerare l'inclusa, e prender la penna, e corregerla sminuendo, ed aggiungando dove Le piaccia, se pure stimerà si posse publicare per la seconda epistola, e meco non usi tanti rispetti, ma operi assolutamente, e parli liberamente, perche vivo Suo scolare obbligato. La potrà mostrare a cotesti Ser·mi se Ella la stima però degna di luce

Questi giorni istessi, e non prima ho avuto fortuna di vedere una placenta uterina, quali ha nell'estremità i lobetti di[79v]stinti, di quella figura, di che si osservano nel pulmone; anzi, che il Sig.r Fracassati nell'anatomizarla più volte è dato in particole cartilaginose La superstizione di questa città non permette vederne una se non ad ogni anno santo, colla presenza di tutto il parentado.

Se occurrerà fare gli esperimenti della prima epistola avverta, che i pulmoni de' cani oscurissimamente anno i lobetti, quali in altri si osservano manifestamente

Circa la cometa alcuna popolari l'anno osservata. Il Sig.r Cassini è a Ferrara, e pertanto non so sii stata osservata da alcuno della professione. Il Sig.r Fracassati

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[7] This week I have your very welcome letter of the 15th with its enclosed draft of your second epistle, which I have admired for the marvels that it contains (my translation)

[8] This was by the Danish anatomist Thomas Bartholin (1616–80) and was published at Copenhagen in 1663 Malpighi's *De pulmonibus* was reprinted as an appendix to this work.

[9] Footnotes will be found with the translation.

La riverisce, e se gli capitasse il taglio per il suo negozio La supplica de' suoi onori mentre io attendendo con ansietà la risposta resto col Sigr Mariani &c

Se occurrerà osservare i pulmoni delle rane cerchino microscopi esquisiti, e la facciano al sole, e con pazienza, altrimente non vedranno altro. Altro non mi occurre dirLa mentre mi rassegno, Bologna 16 Marzo 1661

Da VS Molto Ill·re ed ecc.mo

Div mo ed obblig mo Serv re
Marcello Malpighi

TRANSLATION

Most illustrious and excellent Sir, my revered master While I was writing out the enclosed letter I received a courteous one from you,[10] from which I understand the motives that again urge you not to write an epistle,[11] and also the reasons that you add for me to moderate my first ideas with a second epistle; and although in my last letter[12] I showed myself unwilling to do this, now as you will see I am very ready to do it, and I am more than ordinarily indebted to you for instructing and defending me with such great kindness

This week, and not before, I have been able to obtain frogs, and while I investigated the substance of the lungs with a microscope in the sun or by a light, I found with great labor what is inserted in the epistle.[13] I do not believe that this has been observed by others, and it seems to me that it is of great consequence You will be so good as to consider the enclosed, and to take your pen and correct it, cutting it down or adding to it where you please, if indeed you judge that it can be published as the second epistle. Do not show so much respect for me, but behave firmly and speak freely, because I am ever your grateful scholar You could show it to Their Highnesses[14] if you think it deserves to be brought to light.

In the last few days, for the first time, I have had the good luck to see a uterine placenta, which has at its end the distinct little lobes of the same shape as are observed in the lungs, rather than cartilaginous particles, as Signor Fracassati[15] has called them in dissecting it several times The superstition in this city does not allow me to see one except once every Holy Year,[16] in the presence of the relatives

If you need to make the experiments of the first epistle, note that in the lungs of dogs the little lobes are very obscure, though in others they are clearly observed

About the comet, some of the people have seen it. Signor Cassini[17] is at Ferrara, and in the meanwhile I do not know whether it has been observed by anyone in the Profession. Signor Fracassati greets you, and if he should get the money for his business begs you for your attention,[18] while I, awaiting your reply with anxiety, remain with Signor Mariani[19] etc.

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[10] Probably the letter of 11 March 1661 (Adelmann, ed, *Correspondence of Malpighi,* 1 letter 39, pp 76–79)

[11] Malpighi had suggested that Borelli write a letter to amplify and criticize his results

[12] Letter of 22 February 1661 (Adelmann, ed., *Correspondence of Malpighi,* 1 letter 36, pp 69–71)

[13] I e., the letter that became the second part of the *De pulmonibus*

[14] The Grand Duke Ferdinand II and his brother Prince Leopold, both patrons of scientific research

[15] Carlo Fracassati (d 1672) was a colleague at Bologna. He later moved to Pisa.

[16] I e, "once in a blue moon"

[17] Giovanni Domenico Cassini (1625–1712), professor of astronomy at Bologna, one of the leading astronomers of his time In 1669 he became the first director of the new Paris Observatory

If people need to observe the lungs of the frog, let them look for microscopes of very fine quality, and do it in the sun, and with patience, or otherwise they will not see anything more There seems nothing else for me to say, while I sign myself from Bologna, 16 March 1661,

Of your most illustrious and excellent self
the most devoted and obliged servant
Marcello Malpighi

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[18] This phrase is obscure

[19] Mario Mariani (d 1709), the son of Malpighi's teacher, Andrea Mariani (1593-ca. 1661)

MEDICO-HISTORICAL NEWS AND ACTIVITIES

CORRESPONDENCE AND REPORTS

TEIZO OGAWA (1901–1984)

The death of Professor Teizo Ogawa on 29 April 1984 was a loss for the international community of the history of medicine. In the last eight years, historians of medicine from around the world have been fortunate in having the opportunity to participate in a unique symposium organized by Professor Ogawa The International Symposium on the Comparative History of Medicine—East and West, each year focusing on a different topic and generously supported by the Taniguchi Foundation, is an innovative and valuable way for scholars from a variety of countries to learn of each other's work Professor Ogawa's vision in developing this symposium has led to a vigorous exchange of ideas and a greater understanding on an international level.

Professor Ogawa was born in Oita, Kyushu, in 1901 He graduated from the School of Medicine at Tokyo Imperial University in 1926 The first part of his career Professor Ogawa devoted to the study of anatomy, particularly of the brain, and he held appointments first at Tohoku University and then at the Tokyo Imperial University (later, the University of Tokyo) where he became Professor in the Department of Anatomy in 1944 He spent a year in America in 1937–38 doing research at Northwestern University and Harvard on the function of the red nucleus. In 1958, he became Head of the Institute of Brain Research at the University of Tokyo and in 1962, Professor Emeritus

The second part of his career he dedicated to the field of the history of medicine He was appointed Professor in the Department of Medical History, School of Medicine, Juntendo University, in 1962 and he also served as President of the Japan Society of Medical History from 1960–84 Amongst his many publications, Professor Ogawa was the author of a book on the *History of Anatomy in Japan Before the Meiji Era* in 1955 and his work, *The History of Medicine* of 1964 won a Mainichi Publication Culture Award. He was also famous for his studies on whales He received the Second Class Order of the Sacred Treasure from the Japanese Government in 1972 Professor Ogawa's stimulating influence on the history of medicine in Japan and through the International Symposium provide an important legacy for the field

CAROLINE HANNAWAY

AMERICAN ASSOCIATION FOR THE HISTORY OF MEDICINE

The fifty-eighth annual meeting of the American Association for the History of Medicine will be held in Durham, North Carolina, from 15–18 May 1985 The headquarters hotel will be the Sheraton University Center, Durham, with meetings to be held on the campus of Duke University The Garrison Lecturer will be Frederic L. Holmes from Yale University For more information, contact Local Arrangements Chairman, Dr G S T Cavanaugh, Medical Center Library, Duke University, Durham, North Carolina 27710.

Bull Hist Med, 1985, *59* 109–116

LETTERS TO THE EDITOR

In a recent review of Robert Hudson's *Disease and Its Control* (*Bull Hist Med.*, 1984, *58:* 415–16), I criticized the author for attributing the dispute over contagionism in early modern times to adherence to, or reaction against, particular medical dogmas, and suggested that support for contagionism or the lack of it depended on which particular disease had caught the attention of the particular commentator. It has since been drawn to my attention that on p 145 of his book Dr Hudson does indeed point out that "the nature of the individual epidemic also shaped a given physician's philosophy of contagionism," and cites Fracastoro and Rush as examples I would not want this egregrious oversight of mine to suggest an unwarranted criticism of what I regard as an excellent work.

JOHN NORRIS

I would like to make a *corrigendum* to my review of *Galen's Commentary on the Hippocratic Treatise, Airs, Waters, Places,* ed. and trans. by Abraham Wasserstein (*Bull Hist Med*, 1984, *58:* 246–47) The third paragraph of this review contains a sentence regretting that the editor did not include in his *concordances* (Table 1) the Hebrew translation of the Hippocratic work, *Airs, Waters, Places* Unfortunately this sentence was somewhat ambiguously phrased, and in order to ensure that it be understood in this manner, it should be amended to read "On the other hand in his concordances he has not made use of the extant Hebrew translation of the latter "

ELINOR LIEBER

ANNOUNCEMENTS

NATIONAL NEWS

American Institute of the History of Pharmacy. The annual meeting of the AIHP took place in San Antonio, Texas, on 17–20 February 1985. Papers were given on various topics in the history of pharmacy, including women in pharmacy, pharmacy as revealed in literature, and the history of pharmaceutical education A highlight of the meeting was a presentation on "Pharmacy in the Visual Arts," given by Audrey and William Helfand

A 132-page booklet entitled *Botanical Drugs of the Americas in the Old and New Worlds* was recently published by the International Society for the History of Pharmacy. It includes five papers from the 1983 International Congress for the History of Pharmacy. The booklet may be obtained from the American Institute of Pharmacy, 425 North Charter Street, Madison, Wisconsin 53706 at $3 50 postpaid

Baltimore. Dr. Audrey Davis of the National Museum of American History delivered a lecture entitled "From Tooth Fairy to Tooth Jeweller. The Rise of American Dentistry in the Nineteenth Century" to the Quinan-Cordell Medical History Club at the Library of the Medical and Chirurgical Faculty of the State of Maryland, on 12 December 1984

Daniel Drake Bicentennial. The University of Cincinnati marks the bicentennial of its founder, pioneer physician-educator Daniel Drake, during 1985. An important part of the celebrations planned will be a symposium on medical education, to be held at the University's College of Medicine on 18 October 1985 Further details are available from Charles D Aring, M.D., Chairman of the Daniel Drake Bicentennial Committee, Department of Neurology 525, University of Cincinnati College of Medicine, Cincinnati, Ohio 45267

Delaware. The Medical Center of Delaware, with the sponsorship of the Delaware Humanities Forum, is holding a series of lectures on medical history The first, "Hospital Ward Care in the Eighteenth Century," was presented by J Worth Estes on 6 December 1984. The second and third in the series, "The Self-Image and the Public Image of Physicians. A Photographic Essay," Daniel M Fox; and "Speech, Sex and Submission," William Frawley, will take place in March and June 1985 respectively.

Dental Collectibles. Those interested in the equipment and artifacts of nineteenth- and twentieth-century dental offices may want to order a copy of William J. Carter, et al., *A Catalog of Dental Collectibles and Antiques,* which lists more than 550 items Write to Dental Folklore Books, P.O Box 25642, Overland Park, Kansas 66225 ($10.45).

Historical Publications in Health Administration. A catalogue with this title has been published as a joint endeavor of the American Hospital Association and the American College of Hospital Administrators. It lists the historical holdings (approximately 500 titles) of the Asa S. Bacon Memorial Library of the American Hospital Association, the nation's foremost library in the field of hospital and health services administration. Particular strengths of the Library are hospital histories from the seventeenth through the nineteenth century, hospital administration texts, and the Hospital Administration Oral History Collection. The fifty-page, paperbound catalogue may be obtained from the American Hospital Association, P O Box 99376, Chicago, Illinois 60693 for $25 00

History of Dermatology Society. The twelfth annual meeting of the Society was held in Washington, D C, on 2 December 1984. The Samuel J. Zakon Lecture was delivered by John A. Kenney, Jr., and was entitled "Vignettes of a Black Dermatologist. Reflections on a Thirty-Year Career in Dermatology" The fifth Samuel J Zakon Award in the history of dermatology was bestowed on T. F. McNair Scott for his paper on historical aspects of herpes simplex infections

Papers are now invited for the sixth annual Zakon Award. The competition is open to historians and dermatologists in practice or in training and manuscripts should be submitted to Dr John Thorne Crissey, Chairman, Samuel J Zakon Award Committee, 960 East Green Street, Pasadena, California 91106 by *1 October 1985*

Johns Hopkins Institute of the History of Medicine. A new colloquium series begun in Fall 1984 featured the following speakers. Margaret Pelling (University of Oxford), "Barbersurgeons, the Body and Disease in Early Modern London," 2 October 1984, Guenter Risse (University of Wisconsin, Madison), "Concepts of Disease Edinburgh and Paris, 1770–1820," 8 November 1984; and Todd L Savitt (East Carolina University), "White and Black Responses to the Black Physician, 1870–1920," 13 December 1984

Johns Hopkins Medical Institutions. The sixth annual Humanities Symposium, sponsored by the Committee on Cultural and Social Affairs of the Medical Institutions, was held on 18 November 1984 The symposium dealt with "Medicine in the Mirror of the Stage" "Can a Doctor be a Humanist?" was the question posed by Robertson Davies, Canadian author/actor, and this year's Daniel Coit Gilman Lecturer In addition, he spoke on "The Doctor in the Mirror of Nature" Other speakers were John Houseman, "The Director as a Physician", Geraldine Fitzgerald, "The Doctors and Eugene O'Neill's Mary Tyrone"; Edwin Wilson, "*Oedipus Rex* An Rx for Your Ills"; Marsha Norman, "Playwrights Make House Calls", and Frank Rich, "The Critic as Patient, Diagnostician, and Coroner" Mr. Houseman served as moderator of the symposium.

Medical Humanities Conference—Call for Papers. The Association for Faculty in the Medical Humanities, a section of the Society for Health and Human Values, will hold a conference during the annual meeting of the Association for American Medical Colleges, on 26–31 October 1985, in Washington, D C Papers relating to health care and traditional concerns of the humanities are needed For information, write to Dr David Barnard, Institute for Medical Humanities, University of Texas Medical Branch, Galveston, Texas 77550. Deadline for receipt of essays is *31 May 1985*

National Library of Medicine. A photographic exhibit entitled "Historic Hospitals of Europe, 1200–1981" can currently be viewed at the National Library of Medicine Featuring a collection of several hundred photographs by Grace Goldin, co-author of *The Hospital: A Social and Architectural History* (New Haven, 1975), the display also includes textual material from the Library. The materials originally appeared at the Wangensteen Library of the University of Minnesota and were prepared for the NLM by James Cassedy and Daniel Carangi with the assistance of Mrs Goldin A slide presentation was also given by Mrs Goldin in conjunction with the beginning of the exhibit

The Library held two seminars in the fall of 1984. The first, by Toby Appel, on 14 November, was entitled "Problems in Researching the History of a National Biomedical Society: The American Physiological Society, 1887–1987", the second, "Military Mortality in Tropical Climates in the Nineteenth Century," was presented by Philip Curtin of the Johns Hopkins University on 11 December

New Jersey. The Medical History Society of New Jersey, with the support of the George F. Smith Library of the University of Medicine and Dentistry of New Jersey and the New Jersey Historical Commission, has undertaken an oral history project entitled "Health Professions in New Jersey During the Great Depression, 1929–1939" The project is expected to extend over several years and eventually encompass interviews with forty to fifty health professionals, including physicians, osteopaths, dentists, nurses and pharmacists. In its first year, the Society team has conducted interviews with Arthur Bernstein, Lina Edwards, Morris Saffron, Thomas White, James Hillier and Roy Bowers. Transcripts of these interviews are available from Mr Stuart Sammis, Archivist, University of Medicine and Dentistry of New Jersey, 100 Bergen Street, Newark, New Jersey 07103.

New York Hospital-Cornell Medical Center. The Department of Psychiatry, History of Psychiatry Section, sponsored the following seminars in the spring of 1985. 9 January, "Freud, Katharina, and the First 'Wild Analysis,'" Peter Swales; 23 January, "The World-Wide Traffic in Illicit Narcotic Drugs in the 1920s and 1930s," Terry Parssinen; 6 February, "Adolf Meyer and the Psychiatric Origins of Medicalization," David Tanner, 20 February, "Poetry is a Cure of the Mind Wallace Stevens's Self-Analysis," Joan Richardson; 6 March, "Metaphysical Influences on Laycock's Biological Ideas," Thomas Jobe; and 20 March, "Holy Anorexia," Rudolph Bell

Society for French Historical Studies. The thirty-first annual meeting of the Society convenes on the campus of the University of Southern California, Los Angeles, on 22–23 March 1985. Presentations on medical historical topics include Alison Klairmont Lingo, "Street Healers in the Early Modern Era: Official Perceptions and Popular Experience," and a session entitled "Social Control or Self-Preservation? Medical Welfare in France, 1880–1939" to feature Martha L Hildreth, "The French National Medical Assistance Program: Welfare for Doctors", Jane Crisler, "The Practical Scientist"; and Jo Burr Margadant, "Are Women Different? The Medical History of Women Educators in the Third Republic "

UCLA Program in Medical Classics. This series of lectures, sponsored by the Department of Medical Humanities of UCLA and organized by Dora Weiner and Robert Frank, centers on the "classics" of medicine. The program is as follows: 23 October, "Sir William Osler (1849–1919): The Journey to Sainthood," Charles G Roland (McMaster University, Ontario), 13 November, "Hermann von Helmholtz (1821–1894): Three Facets Among Many," Wilfried F. H M. Mommaerts (UCLA); 4 December, "The Hunterian Legacy. An Apogee of Eighteenth-Century English Medicine," Joseph K. Perloff (UCLA), 15 January, "John Hunter, Frederic Wood-Jones, and the Idea of a Museum," David S Maxwell (UCLA), 12 February, "The Historic Hospital: An Artist's Perception," Grace Goldin; 5 March, "A New Operation for Cataract: Jacques Daviel (1696–1762)," August L Reader, III (University of Southern California); 9 April, "Laennec's *Treatise on Diseases of the Chest,*" Adrian J. Williams (Wadsworth VA Hospital); and 7 May, "Ergot. Between Clinical Medicine and Laboratory Pharmacology," John Parascandola (National Library of Medicine)

Uniformed Services University of the Health Sciences—Culpeper Lectures. The first in the University's series of lectures sponsored by the Culpeper Foundation was given by Eran Dolev, former Surgeon General of the Israeli Defense Forces, on 19 October His topic was "The Medical History of the Entebbe Raid—1976." Gert Brieger of the Johns Hopkins University Institute of the History of Medicine delivered the Culpeper Lecture, entitled "The History of Mitral Valve Surgery" on 15 November 1984

"World's Debt to Pasteur." A symposium with this title was held on 17–18 January 1985 to commemorate the centennial of the first rabies vaccination Sponsored by the Wistar Institute, Philadelphia, and held at the Children's Hospital of Philadelphia, the two-day conference was devoted to examining Pasteur and his many research interests and current research on rabies Among the speakers were Gerald L Geison, "Life of Pasteur" and Tadeusz J Wiktor, "Historical Aspects of Rabies Treatment "

PROGRAMS OF MEETINGS

Bay Area History of Medicine Club, San Francisco

March 14, 1984 "George Miller Sternberg, Surgeon General U.S Army The Walter Reed and William H. Welch Connection," Sanford M. Leeds.

April 11, 1984: "The Flexner Report. Revised or Revisited?" Gert H Brieger

October 10, 1984: "Paul Bert, Successor to Claude Bernard. High Altitude and Compressed Air," Ralph H Kellogg

November, 14, 1984: "Robert Louis Stevenson: Consumption and Creativity," Paul J. Palmbaum.

Josiah C. Trent Society for the History of Medicine, Durham, North Carolina

November 29, 1984· "The Renaissance Clinic. Bedside Teaching in the Sixteenth Century," Jerome J. Bylebyl

Maine Society for the History of Medicine, Rockland

November 3, 1984 "Historical Introduction to Chinese Medicine," J. Worth Estes; and "Twentieth-Century Applications of Chinese Medicine," Hisa Kuriyama

Marshfield Medical History Club, Marshfield, Wisconsin

November 17, 1983. "Hemophilia and the Fall of Imperial Russia," Norman Desbiens.

April 19, 1984. "The Decline and Fall (Due to Alcoholism and Polyneuropathy) of H Newell Martin, Johns Hopkins's First Professor of Biology and Patient of S Weir Mitchell and William Osler," W. Bruce Fye

October 16, 1984. "Development of the Artificial Heart," Douglas Duffy.

November 1, 1984 "Shroud of Turin," Father Francis Filaf

Mayo Foundation History of Medicine Society, Rochester, Minnesota

January 23, 1985. "Giants I Have Known," William H ReMine.

Society of Medical History of Chicago

November 12, 1984 "Seventy-Five Years of Medical History in Chicago," Frank Orland, Joseph Kiefer and Patricia Cloud.

December 4, 1984 "No Non-Sense Abernethy," Eva Beth M. Kienast and H W Kienast; "A History of Hormonal Therapy for Carcinoma of the Prostate," Joseph Kiefer.

University of Virginia Medical History Society, Charlottesville

October 24, 1984. "William Henry Welch and the Creation of Medicine's Scientific Base," A. McGehee Harvey.

November 15, 1984: "The Eighth Evac Remembered Africa and Italy During World War II," John L Guerrant

December 13, 1984. "The Mysterious Last Illness and Death of Napoleon Bonaparte," George R. Minor

Washington Society for the History of Medicine, Bethesda, Maryland

November 15, 1984. "Dandy of Johns Hopkins," William Lloyd Fox; "Theodore Kocher: The Father of Modern Wound Ballistics," Paul Dougherty

January 10, 1985. "The Smith Papyrus The Oldest Surgical Textbook," James Salander; "A Story of Two Medical Congresses in Washington, 1887, 1888," Toby Appel.

NEWS FROM ABROAD

Australia. Dr Ann M. Mitchell, the historian of Sydney Hospital in New South Wales, has produced two informative booklets relating to the history of the institution. One is *A Pictorial Guide to the History of Sydney Hospital* and the other is a report on the extensive records of the hospital, the first in Australia, entitled *The Sydney Hospital Archive. History and the Bicentenary* Readers interested in medical institutional history and archives management in Australia may write to Dr Mitchell at G. P. O. Box 1784, Sydney, N S W , Australia 2001

British Periodicals of Medicine: A Chronological List, 1640–1899. This survey of British medical journals published before 1900 has been reissued by the Wellcome Unit at Oxford University. Originally published by the *Bulletin of the History of Medicine* in 1937, it has a new introduction by W. R. LeFanu, the original compiler, and corrections and additions by its editor, Jean Loudon. An updated index is also included. The softbound publication, numbering 67 pages, is available from the Wellcome Unit for the History of Medicine, University of Oxford, OX2 6PE, England at a cost of $5.00.

Canadian Bulletin of Medical History/Bulletin canadien d'histoire de la médecine. This new journal, for which two 150-page issues a year are planned, is the successor of the Canadian Society for the History of Medicine's *Nouvelles/Newsletter,* which was published from 1978–83. The first two issues contain scholarly articles and shorter pieces in both English and French A forum for readers' opinions, a book review section and news of the profession are additional features. The editor is K. B. Roberts of the Memorial University of Newfoundland Enquiries about subscriptions should be sent to the Treasurer of the Canadian Society for the History of Medicine, Mme Y. Bonenfant, 380 Ch St. Louis, Apt 2007, P Q G1S 4M1 Canada Manuscript submissions should be sent to the attention of Dr K. B. Roberts, Faculty of Medicine, Memorial University, St John's, Newfoundland A1B 3V6, Canada.

International Psychohistorical Association. A convention of the International Psychohistorical Association will take place in Berlin on 12–14 June 1985 Papers will be presented on all aspects of psychohistory, including history of childhood, psychobiography, and group psychohistory. For registration information, please write to the International Psychohistorical Association, P.O. Box 314, New York, New York 10024.

International Society of Tropical Dermatology. Mexico City was the site of the Fifth World Congress of the International Society of Tropical Dermatology Among its activities was a symposium on "The Diseases of Tropical Dermatology. A Historical Approach," directed by Lawrence Charles Parish of the Jefferson Medical College, Philadelphia.

Italy. An international congress on ancient Latin medical texts took place on 26–28 April 1984 in Macerata, Italy The conference was organized by Professor Innocenzo Mazzini (Istituto Di Filologia Classica, Università Degli Studi Di Macerata) and sponsored by the university in collaboration with the Centre Jean Palerne (Université de Saint Etienne), the Istituto Di Latino (Università Firenze) and the Insegnamento Di Storia Della Medicina (Università Bologna)

Twenty papers were presented related to the texts, manuscript traditions, and early printed editions of the Latin medical authors; there was also a roundtable discussion on the *Corpus Hippocraticum* in late antiquity and the Middle Ages. The proceedings will be published in the *Annali della Facolta di Lettere e Filosofia dell'Università di Macerata* A special exhibition of books entitled "Il libro medico del '400 and '500 in particolare le edizioni degli autori greci e latini" was mounted in conjunction with the symposium. The next conference is planned for 1986 and will take place in Lausanne, Switzerland.

Mexico. The Instituto de Investigaciones Históricas of the Universidad Nacional Autónoma de México sponsored a symposium on "Resistance to Scientific and Technological Change" on 18–20 June 1984 Medical-historical topics covered included "El problema de las resistencias en el saber medico," Carlos Viesca, "El antivivisecciónismo: anatomia de la sensibilidad," François Delaporte; "Los presuntos rasgos ideales de la conducta de los cientificos y el caso de resistencia a Semmelweis," Héctor Santiago; and "Resistance to Psychoanalysis [paper read in English]," Zeljko Loparic

Poland. The fourteenth Congress of the Polish Society for the History of Medicine and Pharmacy will be held in Warsaw in September 1985. The congress will deal with the "Basis of Clinical Medicine Development in the Nineteenth Century" Those interested in more information should write to the Organizing Committee, ul. Dluga 16, 00–238 Warsaw, Poland

Society for the Social History of Medicine, Great Britain. The Society held a series of seminars on "Women and Health" in the spring of 1985 The subjects covered were. 18 January, "Deaths in Childbed, 1730–1930," Irvine Loudon; 1 February, "The Life of a Human Football?" Charlotte Mackenzie, 15 February, "Hospital Gynaecology, 1840–1899," Ornella Moscucci, and 1 March, "Women's Health and Women's Work," Antonia Ineson.

Wellcome Institute for the History of Medicine. In cooperation with the League of Arab States, the Institute sponsored a symposium on 13–14 December 1984 on the subject of "Arabic Science and Medicine, 750–1950" Medico-historical presentations included "Rhazes's Pharmacology," A. Z. Iskandar; "Medicine in Twentieth-Century Palestine The Wellcome Connection," Ghada Karmi; "Social and Cultural Implications of the Occult Sciences in Mediaeval Islam," J. C Burgel, "Dear Octopus. Hellenism and Arabic Medicine," Vivian Nutton; "Arabic Ophthalmology," Nashaat Hamarneh; "The Treatment of Insanity in the Muslim World," Michael Dols, "Hectic Fever," Derek Latham" "The Dev*sh*irme System and Ottoman Medicine," Gul Russell, "Cholera in Egypt, 1941–1944," Nancy Gallagher; and a discussion of "Western Science and Medicine in the Modern Arab World" by Zaki Badawi of the Muslim College, London, and Edward Mortimer of the *Times* (London)

BOOK REVIEWS

MEDICINE IN NEW SPAIN

JAMES D. GOODYEAR

An Essay Review

JUAN DE CARDENAS ***Problemas y secretos maravillosos de las indias*** (reprint of 1591 edition). Edited, with notes, by Xavier Lozoya. Mexico City: Academia Nacional de Medicina, 1978 (Nuestros clásicos series, no 3) 320 pp (paperbound).

JUAN DE ESTEYNEFFER ***Florilegio medicinal de todas las enfermedades*** (reprint of 1712 edition). Edited, with notes, by Ma. del Carmen Anzures y Bolaños Mexico City: Academia Nacional de Medicina, 1978 (Nuestros clásicos series, no. 2). 2 vols. xxiii + 973 pp. (paperbound)

ALONSO LOPEZ DE HINOJOSOS ***Suma y recopilacion de cirurgia con un arte para sangrar muy util y provechosa*** (reprint of 1578 edition) Edited by Fernando Martínez Cortes Mexico City· Academia Nacional de Medicina, 1977 (Nuestros clásicos series, no 1). xxiv + 227 pp (paperbound)

The centuries after 1492 witnessed the process of European empire building in the Americas. The first hundred years of Spanish occupation in the New World saw conquest and demographic upheaval along with the florescence of silver mining and transplantation of Iberian culture to the western hemisphere Traditional historiography of the sea-born empires has focused on the impact—positive and negative—of colonialism on the development of Latin America In the recent past a few historians have begun to broaden the context of Atlantic history and culture to accentuate linkages or unities between European metropolises and overseas colonies A seminal study in this emerging tradition is Alfred Crosby's discussion of biological and cultural consequences stemming from the reciprocal relationship of the Old World and the New, published in 1972[1]

Another important work is that of John Elliott (1970) who called upon historians to investigate influences, psychological as well as economic, that the New World contributed to the shaping of early modern Europe.[2] One specific area of inquiry Elliott directs our attention to is the provocative yet disturbing novelty that American social and natural environments held for intellectuals trained in scholastic traditions. He suggests that a study of the thought and deeds of professional men, notably physicians and lawyers, who observed life in the colonies would shed light on the dimension of "culture shock" that the mere existence of the New World administered to European intellectual history

While a few of us have taken Elliott's suggestion to heart[3] the investigation of the responses of European surgeons and physicians to the environs and health problems of the New World is a largely unexplored domain. Until a few years ago medical historians could cite unavailability of sources as a major obstacle in pursuing research

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[1] Alfred W Crosby, *The Columbian Exchange Biological and Cultural Consequences of 1492* (Westport, Conn · Greenwood Press, 1972)

[2] John H. Elliott, *The Old World and the New, 1492–1650* (Cambridge Cambridge University Press, 1970)

[3] James D Goodyear, "Agents of Empire Portuguese Doctors in Colonial Brazil and the Idea of Tropical Disease" (Ph.D diss , The Johns Hopkins University, 1982)

Bull. Hist. Med. 1985, 59: 117–150

But a flurry of publishing activity in Latin American medical history has begun to circumvent this problem.[4]

Of special interest is an effort by the Mexican National Academy of Medicine to issue extensively annotated reprints of Mexican medical incunabula. The first three numbers in the series are reviewed here. Taken together in chronological order (1578, 1591, 1712) the treatises offer insight into the changing concerns and questions—the medical orientation—of European doctors faced with a New World The books reflect dramatically how medical perspectives changed vis-à-vis, first, the waning of Galenism as the dominant medical paradigm in Europe, and second, the ever-evolving health problems in the colony of New Spain

Alonso Lopez de Hinojosos (1534–97) was a Spanish-born surgeon who migrated to the Americas in 1562. His educational background remains elusive despite diligent research by Gérman Somolinos d'Ardois who provides the introductory biographical sketch of the author. It is all but certain that Hinojosos had served an apprenticeship as a surgeon in Spain. In Mexico City he earned extensive clinical experience at the Royal Hospital of the Indies However his treatise reflects very little of this practice. Instead his study typifies the genre of medical literature, common to the period, that recapitulated the wisdom of the most famous doctors. Hinojosos sought primarily to demonstrate his familiarity with the lessons of Guy de Chauliac (1300–67). The *Suma* opens with a definition of surgery—he argued it was an art and not a science—and continues with a description of anatomy, e g, what is flesh? what are the parts of the nose? A discussion of phlebotomy follows, in which the humors are described prior to the presentation of a guide to appropriate techniques and conditions for bloodletting In his section on therapeutics Hinojosos next details the remedies for several dozen ailments, common wounds, and fractures This compilation also includes a few chapters on "bubas" or syphilis, as the editor tells us

Up to this point there is very little that connects the treatise to the New World in general or Mexico in particular Only the occasional biographical remark, or reference to an indigenous medicament ("purga de Guanajuato") or plant (maguey) identifies the book with the Americas. Instead of presenting case histories, or noting medical anomalies or other phenomena not synchronized with European wisdom, Hinojosos was content to apply wholesale his knowledge of Chauliac and humoralism

The only major exception to this pattern is a brief (six pages) final section on an epidemic that struck Mexico City in late August 1576 It raged for several months killing "many Blacks and Indians" with as many as one hundred per day falling victim in a single barrio (Santa Maria) The name for the pestilence was given as *cocolixtle,* and reputedly was the same disease (perhaps typhus) that had appeared in the colony in 1545 Hinojosos disagreed with the "*astrologos*" who said that an unfortunate conjunction of stars had provoked the pestilence. Nor did he concur with the "*medicos*" who attributed the ailment to an abnormally high amount of rain combined with weather fluctuating between hot and cold. For Hinojosos the epidemic echoed the great plagues of medieval Europe, a fearful prospect which inclined him to attribute *cocolixtle* to neither bad stars, nor bad weather, but to the will of God. It was this religious bent which, the editor speculates, prompted Hinojosos to take religious vows a few years later, and be received (1585) into the Society of Jesus

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[4] Guenter Risse, "Medical history in Latin America," *Clio Medica,* 1981, *15*· 233–45

While Hinojosos's treatise suggests a Mexico almost indistinct—at least medically—from Spain, the second treatise under consideration here, Cardenas's *Problemas y secretos maravillosos,* presents an opposite view Cardenas found compelling the differences between the two hemispheres.

Cardenas was born in Spain but while just a boy he migrated to New Spain (c 1575) He apparently arrived with at least a partial education because records show that he received in 1581 a bachelor's degree from Claustro University in Mexico He continued as a student in medicine, graduating in 1584 as *"Bachiller en Medicina"* After a few years of practical experience at the Hospital of San Miguel, he took his licenciate in medicine in 1589, and a year later, while probably in his late twenties, he obtained the degree of Doctor of Medicine

Cardenas organized *Problemas y secretos* into three parts The first two parts are essentially natural history, focusing initially on climatic and geological phenomena, followed by assorted descriptions of novel New World plants and foodstuffs. Cardenas emphasized the distinctiveness, or non-European nature, of New Spain. The heat was of special interest. In an era before the invention of the thermometer or even a concept of temperature, Cardenas speculated about why the Indies exhibited the qualities hot and wet, and why he felt quite chilly in the shade yet uncomfortably warm in the sun of the Indies. He even grappled with the question of why "*la tórrida zona*" was inhabited at all, a circumstance which contravened Aristotle's assertion that the earth should be devoid of life at the equator. Cardenas speculated that ancient cosmographers had not taken into account the cooling effects of the rains, the nearly equal length of days and nights, and the high altitudes found in the Americas

In the 1913 edition of *Problemas y secretos* the editor regarded Cardenas, somewhat unfairly, as "a submissive son of Aristotelian logic . . a poor observer, but a tireless speculator "[5] That Cardenas relied on deductive reasoning in presenting his arguments is true, but it is inaccurate to dismiss him as a poor observer. His whole motivation for writing the book stems from his observations of natural phenomena that did not appear to fit the premises of the ancients, or that the ancients could not have known Indeed his discussion of fruits and vegetables almost entirely concerns products (chili peppers, tobacco, cacao, coca) indigenous to the New World.[6]

But while Cardenas provided detail and speculation about Americana he did not attempt to glorify the Americas. A rather negative view of the Indies issues from the text, especially in the third part which deals with the quality of life for humans in the colony. He first considered the question of longevity, concluding that the natural life span for a man in the New World was at least 10 percent shorter (p 248) than that of a man in Castile. Spaniards born in the western hemisphere appeared to be of more frail and delicate constitutions than their robust Iberian cousins Spanish women too suffered excessively in the climate of the Indies. Even the native population gave little indication of having strong constitutions, and seemed particularly prone to eye ailments This emphasis on insalubrity opposes dramatically the view of Portuguese colonists in sixteenth-century Brazil who praised the "airs" and "waters" of their new land, and smugly wondered about the possibility that Brazil might be the terrestrial paradise.[7] But it must be remembered that Cardenas was witness to one of the greatest demographic disasters in world history[8]

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[5] Quoted in Percy M Ashburn, *The Ranks of Death A Medical History of the Conquest of America* (New York Coward-McCann, 1947), pp 216–17

[6] For a comparison with the Portuguese experience, see Garcia da Orta, *Colloquies on the Simples and Drugs of India,* trans Sir Clements Markham (London Henry Sotheran, 1913)

Jumping ahead a century we encounter a Mexico that has survived the worst of the depopulation crises. It is no longer a society of conquerors and conquered, but of settlers. Spanish ecclesiastical and civil institutions have been transferred across the Atlantic in the colonization process Religious orders are building missions and expanding their influence to the more remote regions, including the southwestern United States A participant in this "spiritual conquest" is Juan de Esteyneffer, S J , who arrived in the colony in 1692, and for the remainder of his life served in Jesuit missions throughout northwestern Mexico

Esteyneffer was German-born (Johannes Steinhoffer, 1664–1716) and an apothecary by training prior to joining the Society of Jesus. As one who believed that the art of curing went hand in hand with administering the sacraments, Esteyneffer worked as nurse, pharmacist, and doctor to the Indians. In the process he developed a keen interest in the medical properties of indigenous flora Out of a desire to serve the mission of the Jesuits better among the Indians he "wrote up" his practical experience, and published (1712) it as *Florilegio Medicinal*

This two-volume compendium of illness and curing in effect was a medical manual written expressly to provide information about health to a society vastly undersupplied by trained medical personnel (p. 142) Esteyneffer wanted to equip his fellow Jesuits with an extensive handbook of practical medical knowledge applicable throughout the colony The treatise therefore was not a learned discourse intended for a professional audience in Europe. It lacked extensive citations of ancient authors, and had no lengthy exposition of a curing philosophy Instead Esteyneffer worked through an extensive list of medical and surgical problems likely to be encountered in Mexico. For each ailment, he defined the condition, characterized the symptoms, speculated about the source of the problem, and outlined specific therapies and procedures

The success of his enterprise was seen in the several editions of the *Florilegio*. It was reprinted in Amsterdam (1719), Madrid (1729, 1755), and Mexico (1887) The popularity of the compendium was so widespread that it may have contributed to medical syncretism between Galenic and Native American medicine in Mexico and the American southwest. One investigator finds marked congruence between certain illnesses described by Esteyneffer and types of ailments extant today in Chicano folk medicine.[9]

Special mention must be made of the outstanding contribution of Carmen Anzures in annotating this treatise. She provides the reader with a variety of reference information including. a glossary of archaic medical terms, an excellent bio-bibliographic introduction; and well detailed appendices on the pharmocopeia and medical botany of Esteyneffer

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[7] Sergio Buarque de Holanda, *Visão do Paraiso Os motivos edênicos no descobrimento e colonizacão do Brasil*, 3rd ed Brasiliana 333. (São Paulo Companhia Editora Nacional, 1977)

[8] William McNeill, *Plagues and Peoples* (Garden City, New York. Doubleday, 1976), especially chapter 5

[9] Margarita Kay, "The Fusion of Utoaztecan and European Ethnogynecology in the *Florilegio Medicinal*," in *Actas del XLI Congreso Internacional de Americanistas* (1976) vol 3, pp 323–30

GERALD D HART (ed). ***Disease in Ancient Man: An International Symposium.*** Toronto· Clarke Irwin, 1983. xvii + 297 pp $24.00 (Can).

This book consists of twenty-one papers presented at an international conference held in London, England, in 1979 In spite of its title it mainly represents a British and Canadian effort with thirteen of twenty-one invited speakers Britons, four Canadians and only four Europeans The speakers were chosen from among his friends by Dr Calvin Wells, the main initiator of the meeting. The book is dedicated to his memory after his untimely death Despite the emphasis on the multidisciplinary approach, the role of the pathologist, the key figure in the diagnosis of disease in human remains, is not mentioned in the introduction and no pathologist was included in the list of speakers

There are five sections dealing with interdisciplinary collaboration, traumatic lesions, infections, laboratory methods and their contributions, and evolutionary and social effects on populations. The papers presented cover a great variety of problems and approaches Anybody interested in disease in ancient man will find something to add to his knowledge.

In the first section Cramp presents the viewpoint of the archeologist, emphasizing the need for more careful excavation and study of skeletal remains and realizing the need of help from the bone pathologist Millet represents the museum archeologist and stresses the need of accurate documentation of time and provenience of the human remains to be studied In his opinion many of the mummies in museums are poorly documented and the dating as well as the relationship to the sarcophagi in which they were acquired are dubious He sees little value in random autopsies of undocumented mummies. Parrot presents the viewpoint of the anthropologist. The thrust of his paper is discussion of pseudopathology caused by animals, plants, and soil He also deals with anatomical variants which should not be confused with pathological changes. Dobson, speaking from the viewpoint of the medical historian, only briefly reviews ancient medical writing, then includes comments on excavations, not strictly medical history. Swinton discusses animal paleopathology in relation to human paleopathology. The main information offered is an enumeration of lesions in various dinosaurs although many of the diagnoses remain questionable

In Section II acute traumatic lesions are discussed by Knowles on the basis of material turned over to him by Calvin Wells The paper contains considerable details about the occurrence and location of lesions in different time periods. Gejvall's paper concerns chronic traumatic and wear and tear lesions observed in some Swedish skeletons He discusses osteoarthritis and degenerative changes of the spine and dwells in some detail on skeletal changes in pregnancy and parturition.

In Section III Birkett, a dermatologist, discusses osteomyelitis and sinusitis, emphasizing the well-known low frequency of pyogenic bone infections in early populations No sinusitis was observed in Bronze and Iron Age skulls but evidence of maxillary sinusitis was found by Wells in 4 to 7 percent of Anglo-Saxon and medieval skulls. Periostitis, transverse lines and soft tissue infections are briefly dealt with on the basis of the literature The outstanding contribution to the section is Hackett's discussion of the pathology of the treponematoses based on his well-known meticulous research on a very large world-wide material There are additional data given concerning the occurrence of treponemal disease in the pre-Columbian Americas. Møller-Christensen presents his studies on medieval leprosy in Denmark and touches briefly on prehistoric evidence of spinal tuberculosis in Scandinavia. Corbett contributes a valuable detailed review on prehistorical and medieval dental caries and periodontal disease, based largely on very careful personal research

The discussions of laboratory methods and contributions in Section IV contain much of interest Hart and his co-workers give a detailed review of modern blood typing techniques and their limited application to paleopathological material. Waldron's observations on lead in bone offer very valuable information and his work is an example of an unromantic scientific approach to paleopathology. Knight deals with the various laboratory methods in establishing the age of a bone sample, removing aging from "expert guessing." The stress is on separating skeletal remains of medico-legal interest from historic and prehistoric finds. This represents a valuable expansion of methods beyond the customary C14 dating Microscopy is covered by Horne who emphasizes the limited use of transmission electron microscopy because of poor preservation of the material Scanning microscopy is more valuable. Pooley stresses the value of combined electron microscopy and X-ray microanalysis on microprobes in the study of dust inhalations The paper presents very clearly methods and data not readily available Helminthic infections are very instructively and clearly presented by Gooch, demonstrating the antiquity and ubiquity of parasitic infections

The key paper in the last section is the paleodemographic view of W. M. S. Russell, based on a large amount of research by him and his wife There are impressive sweeping conclusions on the relationship of overpopulation to, and its correction by, famine, disease and war This is followed by the discussion of the effects of plague in Europe by Slack. Reviews of historic epidemics by Jannsens and Cartwright are mainly of medico-historical interest.

Reviewed by WALTER G J PUTSCHAR, Department of Pathology, Massachusetts General Hospital, Boston, Massachusetts and Department of Physical Anthropology, Smithsonian Institution, Washington, D C.

G E R LLOYD *Science, Folklore and Ideology· Studies in the Life Sciences in Ancient Greece.* Cambridge and New York. Cambridge University Press, 1983. xi + 260 pp $49 50 (cloth); $16 95 (paperbound)

Professor Lloyd's latest book is in territory of which he himself has by now drawn the boundaries His subject is "emerging science". not science already emerged or about to emerge, but certain Greek philosophers and medical writers becoming aware of the special nature of their pursuit through a series of confrontations with traditional beliefs They may incorporate, reject, or justify those beliefs, but in all cases deliberately subject them to critical inquiry or to research The ideal projected by such critical inquiry is what Lloyd means by science. He tells his story through three sets of case studies in the life sciences The theme of the first is zoological taxonomy; of the second, the female sex as biological topic and as recipient of medical care; while the third group is loosely concerned with methodology The period studied extends from the early fourth century B.C. to the second century A.D

The first theme, taxonomy, is the most productive of clear conclusions, probably because the author can draw upon a rich armory of anthropological writing and upon earlier studies of his own. Animal taxonomies have important functions in many cultures To be aware of these when looking at Aristotle's classifications is often suggestive, but Lloyd typically goes beyond the vaguely suggestive and attempts to establish precisely the difference between Aristotle's enterprise and "savage" (including Greek) uses of taxonomy. The difference is between using animals as instruments to think *with,* and "getting clear *about* animals." In this instance we can get a clear view of science emerging from its surround, and it is an instructive example of the value of Lloyd's approach.

In the case of Greek attitudes to women we have an ideology tricked out with folklore. Aristotle attempted a physiological justification of this ideology, with a sweeping disregard (*bad* emerging science) for evidence but with a wickedly devastating critique of the alternative hypothesis suggested by some philosophers and doctors, that women and men play equal and complementary roles in reproduction. Specifically medical attitudes to women are examined through the Hippocratic gynecological texts—still a very unexplored field, in which a beginning has been made by Ann Hanson who is editing them. The background appears to be a tradition of treatment of women by women. The Hippocratic doctors invaded this tradition, in the process establishing a "critical approach" to the treatment of women, but also producing tensions which surface in such matters as the physical examination of women patients by men doctors and the degree of credence accorded by men doctors to women's statements about their own condition. One perhaps unintended conclusion is that it took men physicians to make women's medicine scientific. One could however render this more palatable by making the point that Hippocratic gynecology seems to owe a considerable debt to the tradition, not least in the elaborate pharmacology which so sharply differentiates these texts from others.

The third group of studies has a number of interrelated themes, one being the failure of some later writers to continue along the roads pointed out by earlier scientific writers. The most original and illuminating study is of Greek anatomical terminology: in it Lloyd demonstrates how impossible it was to establish a generally accepted terminology in the absence of the continuity ensured by an institutional framework. This whole section will be of great interest to historians of later periods of medicine, especially the Renaissance (see Lloyd's study of Pliny). But there is a great deal more in Lloyd's book, which like most of its siblings is, too, the product of equal and complementary factors: a refined talent for asking the right questions and much hard work researching the subject matter. A fine example of what Professor Lloyd means by science.

Reviewed by IAIN M. LONIE, Dunedin, New Zealand.

IBN BUṬLĀN. *Das Ärztebankett.* With an introduction, translation, and notes by Felix Klein-Franke. Stuttgart. Hippokrates Verlag, 1984. 323 pp. Ill. DM 49.80.

Ibn Buṭlān, the foremost student of Ibn al-Tayyib, the famous Baghdad philosopher, theologian and physician, and a Christian scholar and medical practitioner in his own right, died in a monastery in Antioch, in 1066, after a life busy with teaching, writing and practising, first in his native Baghdad, and after 1049 in a long stretch of sojourns in Cairo, Constantinople, Aleppo, and Antioch. His literary work, showing remarkable variety and originality, contains a tabular synopsis of dietetics and hygienics (well-known in the medieval West in its Latin translation *Tacuinum Sanitatis*), the notorious exchange of medico-philosophical polemics with his Cairene colleague Ibn Ridwān, a handbook on how to purchase slaves, a treatise concerning the impending schism between the Greek and the Latin church, very interesting autobiographical material, and, neither last nor least, *The Medical Dinner Party*.

With a minimum of drama, this witty conversation between a young doctor, having just arrived from the expensive capital, Baghdad, to a more affordable provincial town up north, his host, an old and eccentric physician, and the fellow guests, all medical specialists, gives the author a welcome opportunity of displaying a series of highly sophisticated medical problems and dealing with a catalogue of professional defects at least as important: incompetence, quackery, avariciousness, mutual disparagement and envy among colleagues, and so on. Thus, Ibn Buṭlān's skit, for all its literary polish, affords a glimpse into the state of the art within its social environment around the year A.D. 1054. The text was (poorly) printed in the beginning of this century; a French summary translation was published in 1928. Professor Klein-Franke—who might have made mention of the latter—has made use of hitherto neglected manuscripts and produced a readable, though less reliable translation (pp. 47–145) than he announces (p. 7). Its accuracy in detail will have to be checked against a new critical edition promised by the translator. The text is accompanied by a commentary of a near-contemporary colleague of Ibn Buṭlān, a certain Ibn Aṯradī, who, with slightly exasperating diligence, sets about to answer most of those intricate questions that are troubling the young doctor from Baghdad (pp. 147–204). Both texts for their part are furnished with copious commentaries (pp. 205–95) and introduced (pp. 9–46) by bio-bibliographical information, a chapter trying to characterize the stage reached by Near Eastern medicine in Ibn Butlān's century, and a literary evaluation of this treatise, rightly stressing the author's aspirations to belletristic ideals.

The handsomely produced book is embellished by five color plates from a series of remarkably vivid illustrations in a manuscript kept in the Mayer Memorial Institute for Islamic Arts, Jerusalem. Six of the eleven illustrations contained in the ms. of the Biblioteca Ambrosiana, it may be added, are superbly reproduced in the catalogue of that collection, vol. I, compiled by O. Löfgren and R. Traini, Vicenza, 1975.

Reviewed by **H. H. BIESTERFELDT**, Seminar für Orientalistik und Indologie, Ruhr-Universität Bochum, West Germany

JEAN-CLAUDE SCHMITT. ***The Holy Greyhound: Guinefort, Healer of Children Since the Thirteenth Century.*** Translated by Martin Thom. New York and Cambridge. Cambridge University Press, 1983 (Cambridge Studies in Oral and Literate Culture). x + 215 pp. $34.50.

In the mid-thirteenth century the Dominican preacher and inquisitor Stephan of Bourbon wrote an account of a superstition which he wished to eradicate. Peasant women from Dombes to the north of Lyon brought sick children to a designated site to be cured by the power of St. Guinefort, allegedly a dog who had been unjustly killed while defending a child. In 1823 a priest from the same parish reported similar practices to his bishop, and in the 1970s archaeological excavations on the site uncovered numerous children's shoes which, from accompanying coins, can be dated 1850 to 1919.

This curious cult has attracted the notice of local folklorists since the late nineteenth century when Stephan's account was first published, but another century has passed before it has come under scholarly scrutiny Jean-Claude Schmitt, associated with the Groupe d'anthropologie historique de l'Occident médiéval, led by Jacques LeGoff at Paris, has chosen the cult of St Guinefort as a means to study the interaction between learned and folk cultures. The subject offered conditions favorable for a pilot project a limited geographic scope, a long duration in time, with sufficient but not overwhelming evidence The central obstacle was the deficiency of not so much documentation as methodology.

To this discrete subject Schmitt has applied a wide range of techniques. As a historian, he reconstructed the context by placing the actors in time and place and by analyzing their activities within medieval conceptions of childhood and the organization of society. As a folklorist, he identified the central motif in at least nine variant versions and five languages from the sixth century B C to A.D. 1300, all of which were subjected to formal content analysis As an ethnographer, he examined the ritual and followed its survival. As a hagiographer, he traced the name of Guinefort to a third-century saint martyred at Pavia, who gained the reputation of curing the plague and children. The cult first surfaced at Bourges (1073), then Cluny (1082), Pavia (1236) and Sens (1241) from which it spread to at least forty places and exhibited common patterns of saint days and formulaic invocations. With the assistance of Jean-Michel Poisson, he excavated the site and situated it within the regional topography

By concentrating intense and multifaceted approaches on St. Guinefort, Jean-Claude Schmitt has demonstrated the cult's coherence and continuity over six centuries. By situating it within the conflicts between peasants and elite groups and within the malaria epidemics induced by diking streams in the region, he has furnished a comprehensive context. But the specific findings of his research are less important than his methodology. Stressing the complementary nature of the disciplines, he refuses to privilege one over the other or to attempt reductionism. "The material traces which have been recovered do not, to my mind, have more 'reality' than the legend collected by Stephan of Bourbon" (p. 163). Each approach illuminates only a facet of reality The scholar's task is to discover the coherent whole without deforming its complexity and fluidity. Achieving this goal for the cult of St. Guinefort, Jean-Claude Schmitt proposes an intriguing model for others

Martin Thom has made the French version of 1979 available to the English-speaking public in a competent and readable translation.

Reviewed by JOHN W BALDWIN, Department of History, The Johns Hopkins University, Baltimore, Maryland

HENRY F. DOBYNS ***Their Number Become Thinned: Native American Population Dynamics in Eastern North America.*** Knoxville University of Tennessee Press, 1983 378 pp $29 95 (cloth), $14 95 (paperbound)

This scholarly work, while informative, broad-ranging, and readable, is nonetheless fairly technical and will appeal mainly to specialists in ethno-history. Only relatively short sections are of direct interest to medical historians, and those parts are likely to be exasperating to most

The author, at the beginning, rather pretentiously announces his intention to examine North American Indian population trends as a whole from the arrival of the first Europeans in 1492 up to the present day, and indeed, the first two short chapters do provide suitable summaries and estimates for the entire area from Alaska to Mexico. However, the bulk of the book turns to be a detailed anthropological-demographical study of the food resources, social organization, and population of only those tribes occupying what is now Florida Ultimately, in his concluding section, the author reverts to his original large-scale approach with brief demographic generalizations about all of the tribes of eastern North America, made partly on the basis of his findings about the Florida tribes.

Professor Dobyns takes his principal theme from a hypothesis that is well known to medical historians from such works as Alfred Crosby's *The Columbian Exchange* (1972) and William McNeill's *Plagues and Peoples* (1976) Through extrapolation from our modern knowledge of viruses and bacteria back into largely unrecorded epochs, holders of this hypothesis maintain that the population history of the American Indians after 1492 was determined, not to any great extent by such factors as food supply failures or military fatalities, but mainly by the devastating impact of European and African diseases upon successive generations of non-immune indigenous tribes, through both direct and indirect contacts. Dobyns hopes, by introducing this hypothesis to his co-professionals, to revolutionize the thinking of ethnohistorians about the size and changing character of these indigenous populations at various stages.

In his first "medical" chapter, Dobyns attempts to illuminate this "biological aggression" across North America during the years since 1492 by summarizing what is known about the principal Indian epidemics of smallpox, measles, influenza, plague, diphtheria, typhus, cholera, and scarlet fever For this information he draws heavily upon a rather small body of secondary works. While the historical literature pertaining to Amerindian epidemiology is certainly not huge, it appears that the author has missed a number of potentially useful secondary works, particularly in such relevant areas as paleopathology, black epidemiology, and ecology.

The author's second medical section similarly summarizes the sparse secondary literature dealing with Florida Indian epidemiology. However, here Professor Dobyns has performed the valuable service of attempting to augment this fragmentary information by culling additional clues as to disease outbreaks and their possible European sources from his extensive reading in accounts of Spanish priests, French explorers, English mariners, and others. Unfortunately, the records are still so sparse that he is quickly forced to fall back upon speculation in order to produce any kind of coherent account, either as to the probable identity of the various epidemics or as to the likely means of their spread Dobyns is highly ingenious in constructing a plausible fabric of possibilities, sometimes from very slim factual evidence. In fact, before he finishes, he almost seems to have convinced himself that the possibilities add up to historical truth Ethno-historians may well, indeed, find that his inferences provide the best explanations yet advanced about the epidemiological history of any Amerindian groups. But they are still no more than possibilities For the medical historian, they necessarily remain an intriguing but more than slightly aggravating collection of "could haves," "might haves," and "may have beens."

Reviewed by JAMES H. CASSEDY, History of Medicine Division, National Library of Medicine, Bethesda, Maryland

A. SCOTT EARLE (ed) ***Surgery in America: From the Colonial Era to the Twentieth Century.*** 2nd ed New York and Philadelphia: Praeger, 1983. xvii + 407 pp Ill. $43.50.

This is a collection of surgical writings taken from texts, journal articles and published lectures There are forty-one items including thirteen additions which did not appear in the 1965 edition which was reviewed in the *Bulletin* (1966, *40* 590–91) The editor has continued to shorten and edit the material for the sake of readability and wisely suggests that "the reader obtain a copy of the original article if the item is of particular interest." One cannot criticize this decision as the book is primarily aimed at the practicing surgeon It does, however, detract from its usefulness to the serious historian of surgery who must consult the unaltered original.

One would have to agree with the inclusion of the majority of articles selected, though keeping in mind it is a selection, and it is not surprising that some areas, such as thoracic surgery, are not represented and one's "favorite gems" may not appear For instance, this reviewer was startled to read that the editor felt that Samuel D. Gross "unfortunately . was the author of nothing that I considered worth including here." I believe an extract from Gross's 1843 publication *An Experimental and Critical Inquiry into the Nature and Treatment of Wounds of the Intestine* which included one of the earliest references to the importance of including the submucosa in an intestinal suture would have been quite worthwhile

Among the new material in this second edition is an edited portion of J. H Bill's "Notes on arrow wounds" which is incorrectly cited as appearing in volume 154 of the *American Journal of Medical Sciences* (It is found in volume N S. 44) and Richard J Hall's "Hydrochlorate of cocaine," mistakenly credited to Robert J Hall. Perhaps the editor fell into the trap as many of us have on occasion On seeing "R.J Hall", one's immediate reaction is to recall the name of a recently active discount haberdasher!

In all seriousness, Dr Earle has accomplished his primary goal He has gathered an interesting set of surgical writings and published them in a format far more likely to hold the attention of today's busy surgeons For the historian, it will not be as useful but can alert one to a piece worth searching out in the original.

Reviewed by **PETER D. OLCH**, Section of Medical History, Uniformed Services University, Bethesda, Maryland.

DENNIS G CARLSON ***African Fever: A Study of British Science, Technology, and Politics in West Africa, 1787–1864.*** Canton, Massachusetts· Science History Publications, USA, Watson Publishing, 1984 xviii + 108 pp Ill $15 95

The role of disease as a factor in the relative isolation of pre-colonial Africa is well known. Coastal West Africa was called the "White Man's Grave" for good reason, as European merchants, soldiers, explorers, missionaries, and slavers died quickly and in large numbers in the pre-quinine era. This mortality helped Africans to defend their political and economic autonomy and ensured that plantation agriculture developed in the New World, not Africa.

This book is part of a substantial and growing literature on the disease barrier and attempts to break it The first chapter in Carlson's slender volume sketches Britain's growing interest in West Africa, from the Sierra Leone colony to the disastrous Niger River expeditions of the 1830s and 1840s There are some problems. It is not true that British industrialism was "largely financed by profits from South Atlantic trading" (p 2), nor was Mungo Park's fatal Niger voyage a short one (p 9). It is a long way from Timbuctu to Bussa, as the map on the same page indicates. There is also some zoological confusion; to have Park worried about wolves in the Western Sudan (p 8) is a bit of a howler.

Three chapters briefly outline malaria as a disease, early theories of fever, and the counter-productive therapeutic techniques of the pre-quinine era Carlson carefully distinguishes vivax malaria, then common in parts of England, from the deadly falciparum malaria of West Africa Two chapters describe the compilation and application of army and navy statistics to the "fever" problem and the rise of quinine prophylaxis This section stresses the role of Alexander Bryson and draws heavily from the author's article in this *Bulletin* ("African fever, prophylactic quinine, and statistical analysis factors in the European penetration of a hostile West African disease environment," 1977, *51*· 386–96), which for some reason is cited only in chapter 1. The last chapter sketches the successful use of quinine, stressing the famous Baikie expedition of 1854.

The book, despite some impressive documentation, adds little to the author's previous article or to Philip Curtin's *The Image of Africa: British Ideas and Action, 1780–1850* (Madison. University of Wisconsin Press, 1964) There are only four references to 1978–80 publications and more recent works are ignored, even Daniel Headrick's *The Tools of Empire* (New York. Oxford University Press, 1981) While it offers nothing new to either medical or African history, the book is a competent short summary of a fascinating story, and many readers of the *Bulletin* will find it enjoyable.

Reviewed by K. DAVID PATTERSON, Department of History, University of North Carolina at Charlotte

JAMES H CASSEDY *American Medicine and Statistical Thinking, 1800–1860.* Cambridge, Massachusetts and London Harvard University Press, 1984 x + 306 pp $22 50

As stated in its preface, this study sets out to deal with two discrete but related topics in American history, i e , American medicine during the crucial early years of its formation as a profession and science, and the introduction and spread of statistical methods in this country during the same period, 1800–60. But rather than being a study of the separate fields, the book actually centers on statistics in medicine at a time when statistics was virtually synonymous with numerical or quantitative methods. This relation proves to be a most revealing topic in itself. It is investigated and described by Dr Cassedy in that thorough and superior manner known from his earlier work on medical statistics

The richness of the book lies foremost in its exploration of hitherto untapped original sources and in its examining others from the statistician's viewpoint. Thence the author deliberately directs the reader through the growing American medical literature of the time. The relation of American developments to those in Europe not being the center of attention, rare use is made of pertinent secondary sources

Drawing up an astounding inventory of the use of numerical methods of argumentation, the author's claim that statistics appeared to the emerging medical profession in the United States as the best and most hopeful way to certainty in medicine is well substantiated. With a palette of purposes (even as evidence in malpractice suits), statistics are shown to have colored every field of American medicine and related areas

Over the whole period, the elite of orthodox American medicine clearly announced their appreciation of the role of statistics, and even called for more use of these methods by others Around 1840 the programmatic statements reached a culmination with Americans—whether they had studied under the French leader of numerical medicine, Pierre C A. Louis, in Paris or not—such as James Jackson, Sr and his son, John C Warren, Jacob Bigelow, Elisha Bartlett, Austin Flint, and Edward Jarvis. Before this period and afterwards these methods seem to have been employed with relatively little fanfare.

Statistical methods were used in medicine, surgery, psychiatry and other emerging specialized fields with the continuing aim of attaining objectivity in nosography, etiology, and evaluation of therapy according to Baconian concepts They were employed as well to justify new medical institutions and ways of bringing about health reforms, and for demonstrating the success of these according to seventeenth-century arithmetical methods They were also used to support alternative medical approaches—by Thomsonians, homeopaths, eclectics and hydropaths of all kinds Cassedy reveals the important quantitative dimensions of medical sectarianism, the claims of which were not always taken seriously enough—in contrast to the lay public—by the leaders of orthodox medicine Epidemics such as the yellow fever at the beginning of the century and cholera in the 1830s and around 1850 afforded opportunities to test precepts old and new statistically These opportunities were eagerly seized, but more often than not, as Cassedy demonstrates, the results ended up corroborating quantitatively preconceived notions. As was recognized by a few contemporaries, this ensued from the defectiveness, shortcomings and manipulative misuse of statistics.

It appears from Cassedy's study that doctors saw the way out of the Scylla of defective statistics and the Charybdis of the hopelessness of abandoning all numbers by calling for a greater quantity of statistics and eventually for more differentiated data This was instead of finding a solution by considering other kinds of data and by refining the mathematical analysis In fact, one gets the impression that little internal methodological development occurred in American medical statistics over the period. American methods were prompted by those same demands, it seems, that the British "arithmetic observationists" of the eighteenth century and Louis around 1830 had put forward: demands for completeness, uniformity of language, regard of collateral circumstances and application of comparative analysis. This is apparently the case, despite notable progress in both medicine and statistics per se, only marginally sketched by the author. The relation between the two fields came to be taken quite for granted, but on a relatively stagnant level, only becoming more common

A significant contribution toward the much needed description of an essential aspect of the development of nineteenth-century scientific medicine, Cassedy's *American Medicine and Statistical Thinking, 1800–1860* will be read with great profit by all historians interested in the period

Reviewed by ULRICH TROHLER, Institute for the History of Medicine, University of Göttingen, West Germany

HELEN COOPER and PETER COOPER. *Heads, or the Art of Phrenology.* London: London Phrenology Company, 1983 105 pp. Ill £5 95 (paperbound)

MADELEINE B. STERN (comp) *A Phrenological Dictionary of Nineteenth-Century Americans.* Westport, Connecticut. Greenwood Press, 1982 xx + 430 pp Ill. $49.95

Almost from the time of its origins in Vienna in the 1790s, phrenology has numbered among its devotees men and women whose fascination with the subject was other than scholarly, philosophical, or scientific. In particular, there have been those whose interest was primarily commercial, and those—increasing in number as time went on—whose interest was mostly antiquarian Helen and Peter Cooper's *Heads, or the Art of Phrenology* and Madeleine Stern's *Phrenological Dictionary* are the heirs to these two traditions, respectively

The Coopers come before us as the sales representatives of their own London Phrenological Company Ltd Although at their shop in St. Martins Lane they appear not to be involved in reading heads, they are, like their predecessors who operated the phrenology shops that once bordered the Strand, interested in selling the wares of phrenology—namely, a "limited edition" of undersized Wedgewood china phrenological heads, a modified reproduction of a Victorian phrenology chart and, of course, this overpriced book with its appended advertisements.

The book, like its nineteenth-century equivalents, consists mostly of an illustrated listing of the mental faculties according to phrenology, to which is added a potted history of the "science" and a concluding chapter on the contemporary approach to "knowing thyself." Among the many things maintained in the last is that "these old phrenological ideas offer enlightening opportunities of looking afresh at human experience," and that "from a contemporary point of view, phrenology can be compared to Yoga . [since] it depends upon a similar concept of localised control" (p 99). Somewhat better, if less curious, are the book's illustrations, which include not only those typical of any mid-Victorian phrenology text, but also several Lavaterian and pre-phrenological ones (e g , Cardani's diagram of the areas on the head of zodiac influence, and Robert Fludd's diagram of mental and physical harmonies) as well as a photo of an early twentieth-century "electric automatic phrenometer."

Representing the antiquarian tradition, and more interesting because of it, Madeleine Stern's *Phrenological Dictionary* is a compilation of one hundred entries on famous American writers, artists, statesmen, educators, businessmen and so on, grouped accordingly. With few exceptions the reprinted entries are taken from the mid- and late nineteenth-century volumes of the *American Phrenological Journal* which was owned and edited by the "phrenological Fowlers" of New York. Typically, entries offer hagiography followed by phrenological delineation, the former circularly proving the truth of the latter. Needless to say, the entries are not most remarkable for their trustworthiness. Nor should it be assumed that the individuals thus sketched were necessarily patrons of phrenology, or even that their heads had been subjected to the bump-feeling hands of phrenologists (the phrenological gaze permitted character also to be read from afar). It is unlikely that the feminist Frances Wright, for instance, (pp 270–72) knew that she was being "visited" and delineated by phrenologists in 1837. Had she known she might well have complained, since seven years before she had written one of the earliest socialist critiques of the knowledge and its practice It is difficult therefore to confirm the compiler's hope, as stated in her otherwise cogent introduction, that the phrenological and biographical analyses presented will "provide fresh insights not only into the personalities examined but into the America of the nineteenth century" (p. ix) Surely they conceal at least as much as they reveal—about the personalities, about nineteenth-century America, about phrenology. After all, these phrenological sketches, more than anything else, were advertisements intended, directly and indirectly, for the financial gain of the "phrenological Fowlers" To that extent the contents of Stern's *Dictionary* are of a piece with the publication of the Coopers.

Reviewed by **ROGER COOTER**, Department of History of Science and Technology, University of Manchester Institute of Science and Technology, Manchester, England

ANDERS BRÄNDSTROM ***"De kärlekslösa mödrarna": Spädbarnsdödligheten i Sverige under 1800—talet med särskild hänsyn till Nedertorneå ["The Careless Mothers": Infant Mortality in Sweden during the Nineteenth Century with Special Regard to the Parish of Nedertorneå].*** Stockholm: Almqvist & Wiksell, 1984. ix + 271 pp. Ill.

Sweden is world famous for its tradition of an almost perfect population registration. Since the founding of the world's first Central Bureau of Statistics in Stockholm in 1749, very detailed records of births and stillbirths, marriages and remarriages, and deaths by age, sex, and cause have been kept in every single parish uninterruptedly until the present day The same holds true for sophisticated short interval censuses of all local populations. From these records, a huge demographic data base has been built up during the last decade, and this information on dozens of carefully chosen parishes has been put onto computer tape at the northernmost university of Sweden in Umeå. Already, it is a splendid and unique laboratory for historical demographers as well as for geneticists, epidemiologists, physical and social scientists, and so on.

Brandström is the first scholar who has made full and excellent use of this well-prepared computerized material For his very well-written doctoral dissertation, he concentrated on the spectacular decrease in infant mortality in Sweden during the nineteenth century On one hand, his approach is microdemographic, studying infant mortality in the parish of Nedertorneå in northern Sweden family by family, linking all infants with their mothers Here, the discussion of the families at high risk (pp 143–66) seems to me not only most stimulating, but also very promising as a guide for future research, combining economic, social, and medical history, etc., with "*histoire des mentalités*" (of the mothers, or the parents) On the other hand, attempting to find how representative were his local research results, Brändstrom investigated infant mortality at a macrodemographic regional level Although the reasons for the decline in mortality were, as might be expected, very complex, he stresses at the end of his comprehensive survey, that it was primarily "a continuous social process" (p. 241), primarily "the result of the influence of cultural factors" (p. 246).

The historian of medicine will be especially interested in the fact that two more, probably just as stimulating, dissertations are already underway in Umeå, one by Britt-Inger Puranen on the decline of tuberculosis in nineteenth- and twentieth-century Sweden (published in 1984) and another by Ulf Högberg on the history of maternal mortality in Sweden, 1750–1980.

Reviewed by **ARTHUR E. IMHOF**, Friedrich-Meinecke-Institut, Free University of Berlin, West Germany

GEORGES CANGUILHEM *On the Normal and the Pathological* Translated by Carolyn R. Fawcett Dordrecht, The Netherlands-Boston-London D Reidel, 1978 (Studies in the History of Modern Science, no 3). Ill. xxv + 208 pp. $31 60 (cloth), $15.00 (paperbound).

Historians of medicine, while paying some attention to the ideas of health and disease, have virtually neglected to address the concept of the normal Norm, normal range, normal value, and normal are not self-evident nor easily defined Edmund Murphy in *The Logic of Medicine* (1976) has even suggested that we might propose that a normal person is anyone who has not been sufficiently investigated.

One writer who has addressed this difficult subject is the French historian of science Georges Canguilhem Canguilhem, his student Michel Foucault says in the introduction to this translation, approached the history of biology from the formation of concepts such as reflex, environment, regulation, and in this case, the normal. Foucault believes that *Le normal et le pathologique,* written as a doctoral dissertation in 1943 with a second part added twenty years later, is without doubt the most significant of Canguilhem's works. We are all indebted to the editors of Studies in the History of Modern Science, Robert S Cohen, Erwin Hiebert, and Everett I. Mendelsohn, for their inspired choice in making this very important work available in English. Even translated into our language it is not the easiest reading, but is certainly worth the effort.

By the time he was studying medicine in war-time France, Georges Canguilhem was already a mature man, a teacher of philosophy, who tells us that he expected medicine to provide him with an introduction to concrete human problems In his thesis he brought his two fields together The result, in my opinion, is a striking book, one that should become very widely known Its resurrection and translation parallels the rediscovery of another very provocative, long neglected work by Ludwig Fleck, *Genesis and Development of a Scientific Fact.*

Canguilhem stresses that the borderline between normal and pathological is imprecise. What is normal in one situation may not be in another It is the individual who must judge whether he or she is capable of the tasks imposed by the environment. Canguilhem traces the idea of normal through the work of the early nineteenth-century French sociologist Auguste Comte, who was influenced by the physician François J. V. Broussais. In the middle decades of the nineteenth century the physiologist Claude Bernard considered a normal function as one independent of the effect it produces The stomach is normal as long as it digests without digesting itself

The third French physician Canguilhem studies in some detail is the twentieth-century surgeon René Leriche. Only a French writer, it seems to me, could describe the state of normal or health as exquisitely as does Leriche: Health is "life lived in the silence of the organs."

Canguilhem disagrees with his three countrymen on the issue that the pathological state is merely a greater or lesser variation of the physiological The problem of distinguishing between an anomaly of structure or function and a pathological state leads to the general problem of biological variability. In evolutionary terms Canguilhem defines a living being as normal " . in any given environment insofar as it is the morphological and functional solution found by life as a response to the demands of the environment." Norm and average must be considered as two different concepts—a statistically obtained average still does not allow us to decide whether an individual is normal or not.

It is fortunate that the author has been able to reflect upon his work a quarter of a century later, taking into account the advances of medicine and science. At the end, he sounds much like Thomas McKeown and his questions about the role of medicine "Normal man's disease," Canguilhem writes on the final page of his book, "is the appearance of a fault in his biological confidence in himself" This is an important, provocative book Now that it is available in an English edition, no medical historian can afford to ignore it

Reviewed by **GERT H. BRIEGER**, Institute of the History of Medicine, The Johns Hopkins University, Baltimore, Maryland

JOHN F FLEETWOOD *The History of Medicine in Ireland* 2nd ed Blackrock, Dublin· Skellig Press, 1983. xii + 373 pp. $25.00.

EOIN O'BRIEN *Conscience and Conflict. A Biography of Sir Dominic Corrigan.* Dublin. Glendale Press, 1983 383 pp. Ill IR£19 50, £15 50, $23.00

Fleetwood's history of Irish medicine was written in 1951 when the author was a young man, remarkably he now presents a second edition, thirty years later The first edition, in the manner of the times, was largely written round a listing of notable doctors and a chronology of hospitals, professional bodies and corporations It was similar to J. D Comrie's *History of Scottish Medicine* but without the lavish illustrations Like Comrie, the author is strong on ancient Celtic medicine. Though the author has had thirty years to ponder on his first version and to take note of the new mood in medical historiography, there seems remarkably little change in the main text, even though it has been entirely reset for this edition The only radical changes are in the chapter on Belfast and the addition of the events and personalities of the last thirty years in Ireland An unfortunate essay on the future of Irish medicine, with a defense of nepotism, finishes the book Thus it remains a semi-chronological internal account of doctoring in Ireland The text is not easy to read and the brief sentences and short paragraphs give it the texture of a reference work There is little attempt at analysis of great events and one looks in vain for explanations of the great era of Dublin medicine in early Victorian times, or reflections on the effects of the many political upheavals in Ireland, notably the break with Britain The close links of Church, State and medical practice in Ireland are unique in the English-speaking world and some detached comment would have been useful

Even as a reference work, the book is deficient and has serious faults Though the index seems serviceable, the text, which is packed with facts, is not annotated, and the references are listed at the end by themes, not chapters When a journal reference is given, the page numbers have been omitted, leaving the entire year to be searched Thus most of the evidence for the text material is hidden.

Corrigan has always deserved a good biographer, and O'Brien's account is splendid Corrigan, the first Catholic doctor to break into the Protestant clique which ran Dublin medicine in the early nineteenth century, made major contributions to cardiology and later became an activist in public health and politics. Often out of sympathy with the consensus view, he had the distinction of being "black-beaned" for membership in the local College of Physicians In the remarkable flowering of Dublin medicine from about 1830 onwards which, like Edinburgh's similar rise one hundred years earlier, followed in the wake of a loss of a Parliament, Corrigan, Stokes and Graves alone in Britain managed to achieve eponymous fame for their clinico-pathological observations, a field dominated by French and German workers. O'Brien deals well with these matters, aided by his assumption that social and political forces shape events, even in clinical medicine. The construction of the book is scholarly, and it is graced by copious notes and references to a rich variety of sources, archival and secondary. There are numerous illustrations and a gorgeous cover, typography is reasonably appropriate, but the occasional homily by the author on the present state of Irish medicine intrudes O'Brien writes well, and the lively narrative gives a vivid account of life in Victorian Dublin.

Reviewed by DAVID HAMILTON, Wellcome Unit for the History of Medicine, University of Oxford, Oxford, England.

G VAN ITERSON, JR., L E DEN DOOREN DE JONG and A.J KLUYVER. ***Martinus Willem Beijerinck: His Life and Work.*** With a foreword by C B. van Niel and a preface by Thomas D. Brock (reprint of 1940 edition). Madison, Wisconsin. Science Tech, 1983. xxix + 181 pp. $45.00

This biography of the Dutch microbiologist and botanist, Martinus Willem Beijerinck (1851–1931), is a reprint of the original edition published in 1940 It initially appeared in two forms, as a separate book and as volume six of *The Collected Works of M. W Beijerinck* (ed G. van Iterson, Jr., L. E den Dooren de Jong, and A. J. Kluyver [The Hague, M. Nijhoff, 1940])

The foreword (new in this edition) by C. B van Niel, a member of the second generation of microbiologists to follow Beijerinck at the Delft Polytechnical School, is called "The 'Delft School' and the Rise of General Microbiology." It is based on a lecture delivered in 1949 before the Society of American Bacteriologists and is apparently intended to provide a context for the subsequent discussion of Beijerinck's contributions to general microbiology. One questions, however, the designation of a Delft "school" dating back to Leeuwenhoek in the seventeenth century. Leeuwenhoek, by van Niel's own account, was a solitary worker who had no pupils and whose methodology was handed down only to the extent that his letters reveal. Thus his intellectual ties with Beijerinck, whom van Niel cites as the second prominent member of the Delft school, are at best indirect One wonders why two sections with little relevance to a biography of Beijerinck were not omitted or abridged· the sections on the microbiologist, A. J. Kluyver, and the lengthy account of problems in microbial metabolism in the late 1940s, well after Beijerinck's death in 1931.

The three essays forming the core of the biography are detailed and well-documented accounts of Beijerinck's life and research. The first, by L. E den Dooren de Jong, one of Beijerinck's research assistants at the Delft Polytechnical School, is entitled "Beijerinck, the Man." What emerges is the portrait of a decidedly difficult and irascible scholar whose life was totally devoted to science. Of particular interest is the section called "Beijerinck at Work" which describes his passion for experiment, his unexcelled skill in wresting information from a microbial plate culture, and his ability to apply his broad scientific knowledge to specific research problems.

Another feature of Beijerinck's work, its marked diversity, is reflected in the over one hundred and forty papers written in the fields of botany, microbiology, chemistry, and genetics. The most significant of these contributions are noted in the two remaining essays.

The botanist Gerrit van Iterson, another of Beijerinck's former research assistants, is the author of "Beijerinck, the Botanist" Beijerinck's many contributions to botany include the then-novel concept of the role of "growth enzymes" in gall formation and plant morphology

The last section, by Kluyver, Beijerinck's successor at Delft, is called "Beijerinck, the Microbiologist" Two particularly noteworthy achievements were the isolation in 1887 of the nitrogen-fixing root nodule bacterium, and the development of the enrichment culture technique Using this technique, Beijerinck isolated for the first time various groups of highly specialized microorganisms In 1898 he described the infectious agent of tobacco mosaic disease as a submicroscopic, noncellular entity requiring a living cell for replication, a concept which foreshadowed the modern concept of the virus

The text contains minor peculiarities of English phraseology, reminding the reader that the authors' first language is not English The publisher failed to omit textual references to appendices that were not included in the new book These are insignificant weaknesses in a book which provides a full portrait of a man whose contributions and lifelong dedication to microbiology and botany deserve wider recognition.

Reviewed by SALLY SMITH HUGHES, Department of the History and Philosophy of Health Sciences, University of California, San Francisco

GEORGE ROSEN *The Structure of American Medical Practice, 1875–1941.* Edited by Charles E. Rosenberg. Philadelphia University of Pennsylvania Press, 1983. viii + 152 pp. $22 50 (cloth); $9 95 (paperbound).

This splendid book, George Rosen's last, provides a provocative account of the development of American medical practice from the late nineteenth century through the outbreak of World War II. It focuses on the struggles of the medical profession to acquire and maintain a monopoly on the medical market and to perpetuate the system of fee-for-service private practice. Specific topics include an analysis of the medical marketplace, the shift to office practice, the transformation of the hospital, the reform of medical education, the rise and triumph of specialization, the debate over compulsory health insurance during World War I, and the emergence of prepaid practice These topics will be familar to most readers of the *Bulletin,* although the discussion of the growth of office practice and professional buildings is fresh and insightful. The real genius of the work lies in the author's vision—in his bringing together so many disparate topics into a persuasive synthesis He provides original and compelling interpretations of problems that have long received the attention of medical historians.

The book is at its best when analyzing the ambitions and desires of ordinary practitioners and the organizations that represented them. Thus, there is much of value about practitioners' worries over income and status—mundane but real concerns that should not escape the scrutiny of historians of medicine. If there is any flaw in the book, it is in relating these concerns of ordinary clinicians to those of the academic physicians who took control of the country's medical schools Rosen appreciates that practitioners and professors of medicine were very different from one another—a rare realization today, considering the prevailing tendency to portray the profession as a monolith. Nevertheless, the book does not convey a sense of how the reform of medical education was engineered by the academic physicians, with ordinary practitioners followers in the movement, if they participated at all The academic establishment zealously pursued this cause for reasons of its own—to make academic medicine a secure career. Most full-time medical scientists and medical teachers had little concern for how much money the average doctor in practice made.

Charles Rosenberg, who never ceases in his services to the history of medicine, has provided yet another valuable service by overseeing the publication of this book after Rosen's untimely death In addition, Rosenberg has added a very useful introductory essay and a critical bibliography. The book is well-written and handsomely produced and represents one of the important works in the history of medicine of the past decade

Reviewed by KENNETH M. LUDMERER, Department of Medicine, Washington University, St Louis, Missouri

SHARON ROMM *The Unwelcome Intruder: Freud's Struggle with Cancer.* New York· Praeger, 1983 xxiii + 164 pp Ill. $19.95.

The subject of Sharon Romm's monograph, Freud's cancer, is hardly one that has been ignored Jones (1957), Schur (1972), and countless others have written about Freud's courageous struggle with his illness and his continued clinical, pedagogical, and literary productivity in spite of it There have been numerous speculations about his cancer's impact on his scientific work and ideas—particularly his increasing emphasis on the death instinct concept, the pessimism (or "realism," as some would prefer) of his later writings on social theory (such as *Civilization and Its Discontents*), and his questioning of the value of psychoanalytic treatment itself ("Analysis Terminable and Interminable," for example) Furthermore, many (including this reviewer in 1978) have speculated about the psychodynamic meanings and motives of Freud's refusal to quit smoking, despite the discovery of his cancer and the repeated warnings of his physicians

Romm (a plastic surgeon and historian) has not, however, simply poured old wine into new bottles She looks at the subject from a genuinely different perspective. The strength of her monograph lies in the clear delimitation and demarcation of her aims and her consistent adherence to a methodology and mode of presentation that best subserves them. Avoiding all considerations of Freud's psychodynamics and, for the most part, the relationship between his ideas and the cancer, she is concerned to document the history of Freud's carcinoma, his manner of coping with it, the procedures of his physicians, and the relationship between Freud and his doctors

Through a skillful combination of oral history, archival research (including examination of Pichler's seventy-seven closely typewritten pages of operation and progress reports), scrutiny of letters, a knowledge of the diagnostic and therapeutic approaches to oral cancer in the 1920s and 1930s, the juxtaposition of the sometimes contradictory reports of Freud's physicians (Deutsch, Hajek, Schur, Pichler, and others), and her own experience in oncology and maxillo-facial surgery, Romm reconstructs the probable site of origin (the glosso-palatine arch) and the course of treatment of Freud's tumor. Historiographically, her work demonstrates the necessity of clinical training and experience for some aspects of the medical historical enterprise.

Her historical and physicianly scrutiny of the relationship of Freud and his doctors to his illness reveals human nature in both its nobility and its flaws. Although her primary intent is not a moralizing one, some of the protagonists receive much better marks than others—Pichler, for instance, than Hajek (whose behavior is questionable on both clinical and ethical grounds). But this is not a story of saints and demons. While she emerged from the writing of this book with untarnished (in fact, she says, heightened) respect for Freud as a person, there is no idealization. There are occasions, as there must be in the course of illness of the most heroic cancer patient, when Freud's customary stoicism and equanimity break down and he becomes plaintive or cranky.

The question with which she ends the volume, "From what sources did the psychoanalyst derive the strength that sustained him in the struggle to keep one step ahead of the cancer?" (p. 135) remains unanswered. Her reference to Freud's fondness for the philosophy of Joseph Popper-Lynkeus (which includes the notion that one's knowledge that he is free to determine when he will give up his life endows a composure like that of the soldier who, if it comes to the worst, knows he can retreat to the fortress) does not begin, I believe, to answer this query sufficiently. Much more important, I would suggest, are the armament Freud acquired in his early and special relationship with his mother (which left him, he often told us, with the feeling of a conquistador), his close and sustaining relationships with friends, family members, and physicians (and especially with his daughter Anna), his knowledge that he had acquired a species of immortality through his writing—which gave him a certain composure in the face of death, at the same time that it spurred him on to burn out every last ember of his creativity, his fatherly affection for, and interest in the growth and development of, psychoanalysis, his intellectual scion; and, finally, the extent to which, Freud's protestations to the contrary, psychoanalysis functioned as his *Weltanschauung* and met many of the spiritual needs that others find in religion and philosophy.

Other interesting facets of this short volume are too numerous to elaborate upon—the biographical sketches of contemporary Viennese physicians, Freud's contact with the surrealists, the bizarre testicular "rejuvenation" operation ("Steinach procedure") Freud underwent in 1923, and the excellent illustrations throughout (many of them by Jan Atlee of the University of Kentucky). Sanford Gifford's foreword is not only a useful Baedeker to the book, but itself expands upon aspects of the Freud-Felix Deutsch relationship that Romm fails to touch upon. On the negative side, there is little to say except that there are a number of typographical errors that should not have escaped the editorial eye (e.g., "Earnest [sic] Jones," p. xi, "Gravida" [*sic*—"Gradiva"] three times on p. 116, "loathe" [*sic*—"loath," from the context] p. 131, "Roazin" [*sic*—"Roazen"], p. 141.

In summary, Dr. Romm has done a nice job of fleshing out an important aspect of Freud's life—the cancer with which he contended for sixteen years. Her consistent focus on a single objective, the brevity of the volume, and its clarity of style make this a readable monograph for anyone interested in the founder of psychoanalysis.

Reviewed by EDWIN R. WALLACE, IV, Department of Psychiatry, Medical College of Georgia, Augusta, Georgia.

RUDOLF SCHUMACHER. *Die Musik in der Psychiatrie des 19. Jahrhunderts.* Frankfurt am Main and Bern: Verlag Peter Lang, 1982 (Marburger Schriften zur Medizingeschichte, vol 4) 191 pp Sw. Fr. 49,00 (paperbound).

Rudolf Schumacher's monograph on the role of music in European psychiatry during the nineteenth century is a comprehensive, well documented and well written study It is supported by a large bibliography, mainly of works of French and German origin but also including English and Italian authors Following a historical review of the earlier use of music in medicine, the author describes music therapy in the nineteenth century in conjunction with the evolution of psychiatry itself. Music in the nineteenth century was not viewed as a therapy to be used alone but as an adjunct to other forms of treatment. Both the therapeutic benefits as well as the limitations of music therapy are described. The need to tailor the music to the individual depending on the patient's personality and illness is emphasized and there is a lengthy discussion of the merits of using music in an "allopathic" fashion or in a "homeopathic" way Music as a therapeutic adjunct is discussed for each form of illness using a mid-nineteenth-century nosography (mania, melancholia, dementia, hysteria). The different forms of music therapy (orchestras, individual performance, dances) as used in various asylums are mentioned as well

The author's discussion of the use of music in psychiatry begins with Esquirol who in the 1820s attempted to find an experimental and scientific method for administering it to various patients. In Germany, physicians in the Romantic period placed less emphasis on a scientific approach and, with their often psychogenic view of mental illness, at times tended to overrate the benefits of music for the insane patient. By the 1830s music therapy, in one form or another, was firmly established in European asylums. In the second half of the century with the rise of organically based "neuropsychiatry" the importance of music as a form of therapy declined, although a certain revival took place within the framework of hypnosis and suggestion after 1880

Music therapy as outlined in this book appears to have been viewed during the nineteenth century mainly as a means of diversion, a calming agent, a pedagogic tool and finally as a form of group therapy under the leadership of the treating physician

In summary, this interesting and comprehensive monograph should be of value to all who are specializing in the field of music therapy today.

Reviewed by MARIE-LOUISE SCHOELLY, History of Psychiatry Section, Department of Psychiatry, New York Hospital-Cornell Medical Center, New York.

JOHN C. BURNHAM *Jelliffe: American Psychoanalyst and Physician* (Part I) and WILLIAM MCGUIRE (ed.). ***His Correspondence with Sigmund Freud and C. G. Jung*** (Part II). Chicago: University of Chicago Press, 1983. xx + 324 pp. $20.00.

This book is the happy outcome of the 1975 discovery by Dr Arcangelo R. T D'Amore of the Smith Ely Jelliffe papers, formerly presumed lost in a fire John C Burnham, experienced in the history of psychiatry, agreed to undertake the biographical section, while the correspondence that makes up the remaining third of the book is edited by William McGuire, who has previously edited *The Freud/Jung Letters.*

Burnham sums up the few facts available about Jelliffe's childhood as indicating a happy, active boy, who early exhibited signs of high intelligence and an excellent memory. Perhaps because he found learning easy, Jelliffe took a long time settling down after gaining his M.D. degree in 1889. First came the postgraduate year in Europe; then frustrating attempts to practice from his parents' home, followed, in 1894, by an appointment as instructor in materia medica and botany; and, a couple of years later, by an association with the *Journal of Nervous and Mental Disease,* which he was later to own and to edit until a year before his death. Jelliffe's neurological career did not begin until 1897, but from that time on he held various teaching hospital appointments in neurology until 1917, when he gave up all his hospital and teaching affiliations. He then expended his vast energy on his neuro-psychiatric practice, on full-time editorship of the *Journal of Nervous and Mental Disease,* on the Nervous and Mental Disease Monograph Series, and on disseminating psychoanalytic ideas.

Jelliffe was present at the famous 1907 debate over psychoanalysis at the first International Congress for Psychiatry in Amsterdam, and there met Jung. In 1909, he was still skeptical about "this whole Freud business," but Burnham demonstrates that Jelliffe gradually changed his mind so that, by 1913, his practice was substantially psychoanalytic. Together, the two sections of this book provide fascinating insights into Jelliffe's relations with Freud and Jung. In 1914, Freud wrote to William Alanson White (co-editor and founder with Jelliffe of the *Psychoanalytic Review*) refusing to contribute an article to their *Review* because he was suspicious of their motives in founding the journal and disapproved of Jelliffe's intimacy with Jung. In 1921, Freud and Jelliffe met in Bad Gastein, spent a whole afternoon in conversation, and apparently made up their differences for they were subsequently to correspond regularly until Freud's death. One consequence, noted by Burnham and illustrated in the correspondence section, was that the Jelliffe-Jung relationship cooled down somewhat in the late 1920s, but they resumed more cordial letter writing in the 1930s.

In the last chapter of the biography, Burnham discusses the difficulties of measuring Jelliffe's influence on his contemporaries and on posterity. This is a thought provoking section, and this reader regrets that Burnham did not interrupt the rest of the biography more frequently with his interpretation of described actions. A more minor quibble is that references to the second section of the book are vague, so that one often is uncertain which letter is intended.

This book should be a welcome addition to the growing number of detailed and specialized works on the history of American neurology and psychiatry, as well as being a unique contribution to the history of medical journalism. Because of the work's fine scholarship, and its subject's varied talents and careers, it should also interest the more general reader.

Reviewed by ELIZABETH LOMAX, Division of Medical History, Department of Anatomy, University of California, Los Angeles, California.

GWYN MACFARLANE. ***Alexander Fleming: The Man and the Myth.*** Cambridge, Massachusetts: Harvard University Press, 1984. xiv + 304 pp. $20.00.

Many readers of Gwyn Macfarlane's thorough and sensitive 1979 biography, *Howard Florey. The Making of a Great Scientist,* must have put it down with a sense of indignation at the way in which Alexander Fleming and his admirers had obscured the brilliant work of Florey, Chain, and their associates in the development of penicillin, and thus obscured history's understanding of the discovery itself. It was not clear from the Florey biography why so much credit had gone to Fleming, whose virtually complete failure to investigate the properties of penicillin surely deserves the longest of all entries in the encyclopedia of missed research opportunities. Nor was it clear exactly why Fleming had fumbled his chance. These and many other questions are now fully illuminated in Macfarlane's second exemplary biography, *Alexander Fleming The Man and the Myth.*

Making good use of a wide range of archival and published sources, and drawing particularly effectively on Ronald Hare's studies of Fleming's penicillin research, Macfarlane portrays Fleming as a competent but not very interesting bacteriologist, content with a modestly successful career as a protégé of Sir Almroth Wright at St. Mary's Hospital. He stumbled upon penicillin, Macfarlane concludes (following Hare and others) through "a series of chance events of almost unbelievable improbability" Fleming did not discover its revolutionary therapeutic properties because, as Hare has shown in an analysis published after the Florey biography, he did not question the results of incomplete, never-published tests by two of his associates which suggested that penicillin was inactivated by serum *in vivo* Fleming lacked the imagination, intellectual hunger, conceptual apparatus (in an age before the sulphonamides), and/or simple scientific rigor that might have caused him to pursue the matter further, anticipate Florey and Chain's work by more than a decade, and cover himself with the glory of having given birth to the miracle of penicillin.

He got most of the glory anyway, far more than he deserved Fleming did not actively seek or claim sole credit for penicillin and he almost always went out of his way to credit the Florey group, Macfarlane points out Many of his admirers, particularly those interested in furthering St. Mary's attractiveness in the fund-raising arena, combined with those in the media who simply did not understand penicillin, science, or discovery, failed completely to understand what Fleming and others were saying. Finally, Fleming himself obviously enjoyed the perks of instant scientific immortality the twenty-five honorary degrees, twenty-six medals, eighteen prizes, five trips to America, five audiences with the Pope, and all the other honors He had always been a sociable clubman who liked worldly comforts and here was the ultimate in worldly success for a scientist Through it all, Macfarlane emphasizes, Fleming maintained his modesty and sense of proportion He probably would have agreed with the conclusion of this balanced, probably definitive biography, that he had not had genius or greatness as a scientist within him—in the way that, say, Florey had—but he had not done badly in his role as a world hero.

A short review precludes more than a brief reference to the intriguing parallels and contrasts that exist between the discoveries and discoverers of insulin and penicillin, probably the two most dramatic medical advances of this century. Banting and Fleming, Macleod and Florey, perhaps even Collip and Chain had much in common, as both scientists and human beings. It took the Toronto group less than twelve months, however, to do with insulin what required fourteen years in the case of penicillin and the British researchers. The most important of the several reasons for this telescoping of the earlier discovery/development process, I suspect, was the existing belief that a therapeutically useful internal secretion of the pancreas was waiting to be found It was not until the discovery of the sulphonamides had paved the way for the concept of a powerful systemic antibiotic that Florey finally took up a challenge that had been lying in the published domain, a discovery aching to be developed, for a full ten years.

The one British scientist who played an important peripheral role in both the insulin and penicillin stories, notably the discussions of patenting, was Sir Henry Dale, a great physiologist in his own right. It is not clear that Dale's advice regarding either insulin or penicillin was particularly sound or useful A biography of the ubiquitous Dale, an ideal subject for a medical historian of Macfarlane's credentials, might be a major step towards clarifying many issues involving science, discovery, patenting and power in early twentieth-century British medical research

Reviewed by **MICHAEL BLISS**, Department of History, University of Toronto, Toronto, Ontario, Canada

ANNETTE B RAMÍREZ DE ARELLANO and CONRAD SEIPP ***Colonialism, Catholicism and Contraception: A History of Birth Control in Puerto Rico.*** Chapel Hill University of North Carolina Press, 1983 xii + 219 pp $24.00

Historians have tended to follow two main approaches to the history of contraception. In the first the assumption is made that the way to lower fertility is by providing the appropriate technology Those who adopt this approach accordingly focus their attention on the doctors, medical scientists, birth control advocates, and government policy planners who produced and distributed contraceptive information and materiel In contrast to this medical model is the "development as the best contraceptive" model This latter approach is advanced by those who are of the opinion that population control and development are linked and that the first will not be successfully attained until the problems of poverty and social inequality are dealt with The authors of the book under review do provide a succinct account of medical advances in twentieth-century contraception, but are clearly most sympathetic to the developmental model They repeatedly stress the fact that the population control issue cannot be understood if isolated from the social and economic realities of Puerto Rican society Indeed they provide a remarkably full account of the political and economic history of the island as it painfully made its way from the position of colony to the ambiguous status of "commonwealth."

Having established the importance of Puerto Rico's dependent political and economic position vis-à-vis the United States the authors proceed to trace the multiplicity of motives that led to the rise of family planning activities on the island. Their cast of characters is large and includes local politicians like Luis Muñoz Marín and José Rolón Lanauze, paternalistic philanthropists like Clarence Gamble and Joseph Sunnen, and the staffs of major organizations like the Brookings Institute and the Rockefeller Foundation. Ramírez de Arellano and Seipp are coolly dismissive of the Catholic Church's opposition to birth control but they also fully document the bizarre views of the "do-gooders" who were convinced that contraception would be the panacea for all the island's problems Thus we have Dr Rhoads describing Puerto Ricans as "the most degenerate and thievish race of men ever inhabiting this sphere," Gladys Garland reporting to Clarence Gamble that success with diaphragms was assured in Puerto Rico because of "the lithe figures of the women, their long fingers, lack of inhibitions in regard to sex, and their teachability," and Dr Pincus attributing the reportage of oral contraceptive side-effects to the "emotional super-activity of Puerto Rican women." Indeed, because Puerto Rico's high fertility rate attracted the attention of so many zealous researchers it had the dubious distinction of becoming a testing ground for oral contraceptives, IUDs, and Depo-Provera.

Despite all the sophisticated attempts to lower the island's fertility, Puerto Rico enjoys in the 1980s a birthrate higher than that of many Latin American countries that have not had publicly subsidized contraception campaigns. The great value of Ramírez de Arellano and Seipp's study is that they painstakingly describe the inherent weaknesses of the various birth control programs tried out on the Puerto Ricans They concluded that birth controllers were bound to be disappointed because most were looking for a "technological fix" and failed to appreciate the fact that the fertility level only could shift as cultural and developmental change occurred

Because the authors are so successful at pointing out the problems of employing a "top down" approach to the population issue one finishes the book wondering why they themselves say so much about policy planners and so little about popular culture For example, although the word "Catholicism" appears in the title, the authors actually say little about the religious culture of Puerto Rico Given the fact that sterilization seems to be more acceptable than contraception because resort to "la operación" entails not repeated, but only a single, violation of Church doctrine it would seem that more could be said about the importance of moral constraints. Some discussion of sex roles, marriage patterns, attitudes towards children, and traditional birthing practices would also have improved what is already a very useful study

Reviewed by ANGUS MCLAREN, Department of History, University of Victoria, Victoria, B C., Canada

JOEL W. EASTMAN *Styling vs. Safety: The American Automobile Industry and the Development of Automotive Safety, 1900–1966.* Lanham, Maryland· University Press of America, 1984. xvi + 280 pp $25.00 (cloth); $13.00 (paperbound)

What one measure better reveals the dark side of America's love affair with the automobile than the annual toll of highway deaths and injuries? In this detailed and sometimes shocking account Joel Eastman explains how automobile accidents have become our nation's number one public health problem and why, despite some heroic efforts by individual physicians and safety crusaders, neither car makers nor the government have done much about it until recently.

As the title suggests, Eastman places much of the blame for the auto industry's poor record on an obsession with styling, often at the expense of safety Back in the 1920s, Detroit discovered that image, not engineering, sells cars, and ever since, American car makers have been offering us fantasy machines long on speed and glamor and short on good brakes, handling, and other safety features The "annual model gimmick," Eastman claims, turned the car business into a part of the fashion industry, and "tragically, although the strategy produced enormous profits for the industry, the new models on which the money was made were less economical, less efficient, and in many ways less safe than the vehicles they replaced" (p 42)

Of course, the auto makers protested that they were only giving customers what they wanted, and that safety simply would not sell And in fact the sales records of "safety cars" were pretty dismal. Tucker and Kaiser went broke trying to sell Americans on safety Ford, under Robert McNamara, made safety its corporate theme for 1956, won praise from the media, and got "clobbered" in the showroom by performance-oriented Chevrolets.

What small effort Detroit did put into safety was concentrated on public relations and driver education. The industry consistently claimed that its cars were safe and getting safer and that the real problem was how to improve the driver. It heavily supported organizations like the National Safety Council (NSC) which promoted driver training programs in the schools and pushed national safety consciousness campaigns. Eastman charges that this "safety establishment" was controlled by the auto companies and shifted attention away from expensive automotive redesign and toward highway planning and driver education, which cost the industry nothing.

Both Detroit and the safety establishment had their critics over the years. Some of the most vocal were physicians who had seen firsthand what unsafe automobiles could do Eastman produces a fascinating cast of characters who, in the face of public apathy and industry resistance, did what they could to study and promote automotive safety. Claire Straith, a plastic surgeon who designed padded dashboards and put seatbelts in his own car in the 1930s, took his safety message on the road with grisly slide shows for automotive engineers John Stapp, physician and Air Force colonel, did crash research with anesthetized chimps, hogs, and even a human volunteer or two, before Congress, under pressure from the auto lobby, cut off his funds

These noble efforts had little impact on public policy in the short run Not until auto safety became the crusade of influential public officials, most notably Senator Abraham Ribicoff, did the balance shift. Ribicoff's 1965 Congressional hearings on automotive safety, along with Ralph Nader's best-selling *Unsafe At Any Speed* (Nader was at the time an advisor to the Ribicoff committee) made auto safety a national issue. A year later Congress passed the National Traffic and Vehicle Safety Act, starting an avalanche of legislation that would assign the federal government broad responsibilities to dictate standards for automotive safety, emissions, and fuel economy

Eastman has tackled an important, and overlooked, subject with obvious diligence and energy His research into the periodical literature and government documents has turned up some intriguing stories. However, the book retains too much of a dissertation flavor, with confusing chronology, repetitiveness, and a tendency to offer citation as a substitute for analysis. Thanks to its publisher, University Press of America, it even looks like a shrunken dissertation wrapped in a soft cover. Eastman deserved more professional production, and better editorial advice. Exposed as we all are to the risks of the road, exposés on automotive safety have been good sellers It is a pity that Eastman did not make more of his opportunity to add significant historical perspective to the journalistic literature.

Reviewed by STUART W. LESLIE, Department of the History of Science, The Johns Hopkins University, Baltimore, Maryland.

PAUL R. GREENOUGH ***Prosperity and Misery in Modern Bengal: The Famine of 1943–1944.*** New York and Oxford Oxford University Press, 1982. xvii + 342 pp $37.00.

The Bengal Famine of 1943–44 was one of the worst in modern South Asian history. The famine is the subject of an excellent study by Paul Greenough The famine's impact was such that Bengalis, even today, view it as a watershed in their history—the time at which the legendary agricultural wealth of Bengal failed and the time at which modern Bengali misery began Paul Greenough has written an excellent description of the famine and its causes. Further, he has provided an important analysis of the cultural reaction to the catastrophe and a thoughtful critique of current Western attitudes concerning disaster relief.

Greenough's work indicates that the Bengal Famine was the result of changing social, economic, and political relationships that occurred during the one hundred year period prior to the famine—changes that came about largely as a consequence of British Imperial rule The famine killed, directly or indirectly, some three million people Relief efforts failed largely because the British and urbanized Indians in charge of the Bengal Government simply did not understand the complexities of the rice market mechanisms at work in Bengal. Greenough argues that there was not a rice shortage of sufficient magnitude to cause a catastrophe of the sort that occurred. The shortage, he suggests, was because Bengali landlords and tenured peasants were reluctant to release their rice stocks (and thus face starvation themselves) to a market that had been severely dislocated as the result of heavy handed government intrusion.

An even more interesting side to Greenough's study is his analysis of the famine mortality statistics and their cultural implications Greenough's work demonstrates that the age and sex groups that suffered *least* were males and females between twenty and thirty years of age, with males having an advantage overall He concludes from this and other evidence that there were " non-biological mechanisms at work .. which distributed mortality in ways in which biological considerations alone cannot predict Cultural practices seem likely to have been significant" (p 243). Greenough argues that those practices were designed (as they are today in other famine prone areas) to allow those most likely able to replicate the pre-existing culture to survive. Scarce food resources were and are denied to those who either cannot produce children or cannot help immediately and productively in the economic reconstruction which must follow a catastrophe of the size and scope of the Bengal Famine if group and culture are to continue

Greenough's conclusions regarding the significance of survival statistics leads to an insightful critique of current relief policies that have been implemented by Western directed relief agencies to cope with subsistence crises. Greenough suggests that the maternal child health approach taken by these agencies is unrealistic in regions subject to catastrophic famine Such areas, he argues, have developed their own cultural mechanisms to deal with famine and survival Relief measures that emphasize support for the helpless (infants and young children) at the expense of the strong tend to distort (and be distorted by) long standing cultural mechanisms for survival One result of these distortions is likely to be prolongation of the disaster.

Prosperity and Misery in Modern Bengal is an important addition to the literature concerning disaster in Third World countries Greenough's work will be of interest to historians of modern South Asia and of medicine as well as those concerned with the development of policy concerning health and nutritional disaster relief—whether the disaster is natural or man made.

Reviewed by JOHN C. HUME, Jr., Department of History, St. Mary's College, Raleigh, North Carolina

GEORGE CLARK and FREDERICK H KASTEN ***History of Staining*** 3rd ed Baltimore and London Williams & Wilkins, 1983 x + 304 pp $29 95

The development of staining techniques in the mid-nineteenth century provided biologists with a formidable tool for the investigation of the microscopic world An endeavor which began with the empirical use of natural vegetable dyes to enhance anatomical descriptions of protozoa and tissues, has developed, with the use of aniline dyes, into a complex field that enables scientists to locate chemical elements within the cell This book traces the history of stains from their familiar use as a method of visual enhancement for microscopists to their transformation into an independent object of study for the histochemist

The first edition of the *History of Staining* was published in 1933 It resulted from the compilation of a series of articles written for *Stain Technology* by Cornell bacteriologist Harold Joel Conn (1886–1975), a long-time member of the Biological Stain Commission In 1948 Conn provided a second updated edition. The authors of this third edition inherited the task from Ralph Dougall Lillie (1896–1979), head of the Laboratory of Pathology and Histochemistry at the National Institutes of Health from 1948 to 1960, who was preparing the third edition at the time of his death This edition is a fitting memorial to Lillie, to whom it is dedicated. Kasten has written a biographical essay of this pioneer histochemist which includes his complete bibliography

The present authors have retained much of the original material from Conn's editions, as well as his intent, which was to provide historical background on the use and development of stains for scientific investigators and instructors in the field. Consequently, the book has the character of a detailed review of the literature This approach, in conjunction with the extensive bibliography and useful index, allows for rapid identification of the original sources and makes this book most valuable as a reference work. The chapters relating the earliest use of stains are organized around the nature of the dyes (cochineal, logwood, and aniline), with the remaining chapters describing staining advances in various biological fields such as histology, bacteriology, cytology, protozoology, and neurology Unfortunately, in some chapters the details of the chemical changes in stain formulas are often related with little reference to their biological applications Cameo biographies of many pioneer investigators like Paul G Unna, Paul Ehrlich, and Frank B Mallory, are interspersed throughout the chapters

Of particular interest are two new chapters, written by Kasten, on the development of fluorescence microscopy and the histochemistry of proteins and nucleic acids The introduction of a single modification in a staining technique has often had profound consequences for the biomedical sciences For example, Albert Coons's innovative use, in 1941–42, of antibodies linked to fluorescent stains led to a scientific specialty known as immunocytochemistry, which has not only enhanced our knowledge of internal cellular structure, but has found widespread application in medical diagnosis These chapters will provide information of special interest to historians concerned with the relationship between techniques, the practice of science, and the formation of special fields of scientific investigation.

Reviewed by **PATRICIA PECK GOSSEL**, Department of the History of Science, The Johns Hopkins University, Baltimore, Maryland

F-A. SONDERVORST **Histoire de la médecine belge.** Zaventem, Belgium. Elsevier Librico, 1981 xii + 326 pp. Ill $53 00.

Written for a general public and on the occasion of the one hundred and fiftieth anniversary of Belgium's independence, this "selective synthesis" is most remarkable for setting medical developments in the context of national and, to some extent, European history The political and social background is sketched in greater detail than the cultural climate, but this may be a boon to readers who are not familiar with this small country so often overrun by conquerors and so constantly threatened by disunity. From the absorption of the Ligurians by the invading Celts (ca 1500 B.C) to the post-World War II "*américanisation,*" the history of Belgian medicine unfolds as a continuum whose accelerated pace and diverging specializations in the end leave the author somewhat breathless Unflagging, however, in his patriotic optimism, Sondervorst emphasizes the advances while noting but minimizing the setbacks in research and care through ages of class conflict, religious strife, squabbling ("*parfois folklorique*") between public and private education, and tension between Walloons and Flemings (the latter may wonder why this book came out only in French).

Belgium's stormy past as well as her accomplishments in medicine are mirrored in the educational institutions which provide the framework for much of this survey, and particularly in the University of Louvain, the author's alma mater While virtually every medical society and congress is mentioned, there is little or no information on historic institutions such as St. John's Hospital in Bruges or the insane asylum-community in Gheel. A few national "specialities" emerge, ranging from balneology, a byproduct of Spa's popularity, to tropical medicine, a bonus of colonial days; perhaps most significant is the Belgian system of public health insurance which, through trial and error, has come closer than most towards reconciling government responsibility with professional principles and private initiative

Far from being a mere catalogue of institutions and achievements, the book is enlivened by the evocation of bygone society and by biographical sketches that draw on the author's personal research. Thus, a convincing case is made that the anatomist Spigelius died in 1625 of septicemia two months after having cut his finger at a daughter's wedding. The long-range significance of Van Helmont's ideas is matched by a sympathetic appraisal of his personality Most touching is the portrait of the pioneer of De Panne's military hospital, Antoine Depage, and of his wife who perished with the *Lusitania* while bringing aid from the United States Surprisingly succinct, on the other hand, is the paragraph on Joseph Tricot-Royer, the founder of the Société Internationale d'Histoire de la Médecine whom Sondervorst succeeded as a dynamic organizer, teacher, and writer.

Reviewed by LUKE DEMAITRE, Department of History, Fordham University, New York.

JOHN G HOWELLS and M LIVIA OSBORN **A Reference Companion to the History of Abnormal Psychology,** 2 vols. Westport, Connecticut. Greenwood Press, 1984. xviii + 1,141 pp. $95 00 (set).

This reference work serves well the bibliophile, the medical historian, and the layperson seeking concepts and names more arcane than those found in dictionaries and encyclopedias. However, the historian of science or medicine will find it frustratingly limited by the editorial decision to allow only one reference per entry, and the tertiary or obsolete nature of some of the sources used. If there were one improvement wished, it would be that the citations had been uniformly the best—rather than the most convenient.

This quibble aside, the scope and organization of the work are truly commendable. To convey the range of the 4,200 references to eminent physicians, mythological heroes, diseases, kings, and places, the entries receiving twenty or more citations in the index are listed here: alcoholism, American Psychiatric Association, Aristotle, asylums, Bethlehem Royal Hospital, Bible, bleeding, Bleuler, brain, Burton, Charcot, classification of mental disorders, cretinism, delirium, delusions, diet, dreams, epilepsy, Esquirol, exorcism, Freud, general paralysis of the insane, hallucinations, Hippocrates of Cos, homosexuality, humoral theory, humors, hypnotism, hysteria, idiot, inquisition, Janet, Jung, Kraepelin, lunatic, madhouses, magnetism, mania, melancholia, mental retardation, Mesmer, Mesmerism, Middle Ages, monks, mythology, neurosis, obsession, occupational therapy, opera, opium, paranoia, phrenology, Pinel, Plato, possession, psychoanalysis, psychopathy, psychosis, psychotherapy, restraint, Rush, Sâlpetrière, schizophrenia, Shakespeare, suicide, syphilis, witchcraft, and Wundt.

Another useful feature for social historians of medicine is the institutional entries. Journals are handily listed with dates of founding, founding editor, and the sequence of names of those journals. Institutions and associations are also identified. It is a shame that some of the recent secondary sources are not cited, however, e.g., the work of John Burnham, Norman Dain, Gerald Grob, and Ruth Caplan. The categories in the appendix will also facilitate social history research: abnormal behavior, animals, art, bioscientists, body components, caring professions, clinical states, concepts and theories, disciplines and schools, drugs, exalted people, gems, hypnotism, institutions, journals, legislation, literary characters, literary works, locations, movements, natural phenomena, neurologists, patients, peoples, philanthropists, philosophers, practices, psychiatrists, psychological tests, psychologists, saints, suicide, superstitions, terms, treatment, wells, witchcraft, and writers.

The reader may be interested to know that the editors were director and clinical research officer at the Institute of Family Psychiatry in Ipswich, England. Howells is also the author of *Modern Perspectives in International Child Psychiatry* (1969) and *World History of Psychiatry* (1975).

Reviewed by **WILLIAM R. WOODWARD**, Department of Psychology, University of New Hampshire, Durham

ALFRED P. FISHMAN and DICKINSON W. RICHARDS. ***Circulation of the Blood: Men and Ideas*** (reprint of 1964 edition). Bethesda: American Physiological Society, 1982. xx + 859 pp. $56.00 (Distributed by Williams & Wilkins, Baltimore)

The reappearance of old friends is a welcome event. "Fishman and Richards" is no exception. This volume was first published in 1964 and is re-issued now in anticipation of the centenary of the American Physiological Society in 1987. Its contributors are, and sadly in some instances were, all distinguished authorities on cardiovascular physiology. As authors they were given relative freedom to write as they wished on themes within the history of the discipline. The volume therefore is far from being a comprehensive account of the history of the investigation of the cardiovascular system. But when the authors deal with modern material it is an invaluable guide to a number of special areas and the associated literature. Of none of the papers is this more true than the article on "Electrocardiography" by Katz and Hellerstein This is wonderfully detailed, relatively up-to-date, and filled with invaluable references However, all the pieces, without exception, offer something useful both bibliographically and, incidentally, autobiographically. For they are all suffused with the various historical philosophies of their eminent authors

Reviewed by CHRISTOPHER LAWRENCE, Wellcome Institute for the History of Medicine, London, England

W L JONES ***Ministering to Minds Diseased: A History of Psychiatric Treatment*** London. William Heinemann Medical Books, 1983. x + 157 pp £7 50.

British psychiatrist W L Jones has produced a very useful survey of changing treatment modalities in the history of psychiatry. The book is sensibly divided into three straightforward sections on "Somatic Treatments," "The Psychotherapies," and "Environmental and Social Treatment " Not surprisingly perhaps, Jones is at his best in describing those twentieth-century British developments with which he is most familiar. If there are shortcomings in his general approach, they lie in two areas First, Jones displays too easy an acceptance of the "progress" that "science" has brought to the treatment of the mentally ill "The history of psychiatric treatment," he declares, "shows a continuous refinement with experience and the advance of scientific knowledge" (p. 30) His own evidence suggests, however, that in the treatment of mental illness, the more things have changed, the more they have remained the same. Second, Jones unfortunately pays little more than lip service to the social historian's central preoccupation the crucial relationship between psychiatric treatment and the "social climate of the place and time" (p 1) Essentially, *Ministering to Minds Diseased* remains an "internalist" history of changing psychiatric therapies. Jones, nevertheless, has made a valuable and worthwhile contribution to the historiography of psychiatry His short history will undoubtedly become a standard handy reference for both psychiatrist and historian alike

Reviewed by THOMAS E BROWN, Edmonton, Alberta, Canada

LYNNE A. LEOPOLD ***Radiology at the University of Pennsylvania, 1890–1975.*** Philadelphia University of Pennsylvania Press, 1981. xvi + 163 pp Ill $35 00.

Modern medicine is famed for its use of technology The story of radiology helps to explain this its rapid rise and growth has had an impact on practice that is scarcely appreciated outside professional medical circles Earlier classic texts by Bruwer and Grigg attempted a world view of the growth of this specialty, but this volume is an account of radiology in a single hospital, albeit a major one

The author, modestly revealing her name only at the end of the preface, has compiled the book from the administrative records and the personal recollections of senior radiologists in the hospital of the University of Pennsylvania. The result is essentially chronological and non-critical, in the tradition of older hospital histories

There are four major chapter heads. The introductory section on early years is followed by three parts dividing the life of the department into the eras of its past directors—Pancoast, Pendergrass and Chamberlain Each chapter is subdivided into several small sections and is followed by extensive footnotes The book ends with a biographical appendix in note form, a bibliography and a list of the radiology staff of the hospital Its fourteen well-chosen illustrations have reproduced well and the resulting book is attractively but not luxuriously produced.

It is to be regretted that there is no index, especially as the chronological treatment necessarily ensures that particular themes, such as staff training or financial problems, recur at frequent intervals More seriously I criticize the work as not being a history of radiology, except perhaps in the first chapter, but an administrative history of the department. Thus a pioneering opportunity has been lost

Reviewed by JEAN M. GUY, Department of Radiology, Yeovil District Hospital, Somerset, England

JULIO L RUFFINI (ed) *Advances in Medical Social Science*, vol 1 New York Gordon and Breach Science Publishers, 1983 xvii + 405 pp $44 50

The importance of the social sciences for the broader questions of health and disease, as well as for the consideration of their historical nature, has become sufficiently well accepted so that major review articles are appearing with some regularity The editor of this volume, a medical anthropologist at the University of California, San Francisco, has brought together a group of scholars who in successive chapters provide very useful reviews, with many references, of the fields of health psychology, sociology of medicine, health economics, medical geography, and medical anthropology Three additional chapters are concerned with power and politics of health, with the role of the behavioral sciences in medical education, and a very brief chapter, on the uses of medical history by Stanley J. Reiser

Unfortunately, our field is very poorly represented Reiser's "chapter" of six pages says nothing about the field of medical history, and the editor showed little judgment, in my opinion, by including it in an otherwise useful volume Many of the authors discuss historical medicine and some even describe the evolution of social medicine, as in the work of such well-known names as Bernhard Stern, Henry Sigerist, George Rosen, and Erwin Ackerknecht. David Landy's 129-page review of the field of medical anthropology, with its extensive bibliography is alone worth the price of admission

It is too bad that the book seems to have been in press for a long period There are no references after 1980, thus many other useful review articles and some important books are ignored One author even refers to the Department of Health Education and Welfare as if it still existed with that name

Despite the fact that the history of medicine is poorly represented, there are discussions of many important trends and useful references to be found throughout the book, thus making it a source for understanding our sister disciplines They surely seem to be interested in what we are doing It is too bad that we lost the opportunity to be more explicit about our field.

Reviewed by GERT H BRIEGER, Institute of the History of Medicine, The Johns Hopkins University, Baltimore, Maryland

STANLEY WOHL. ***The Medical Industrial Complex.*** New York: Harmony Books, 1984. 218 pp $14.95

In a book clearly designed for the layman, Dr. Wohl draws a potential horror picture. Disaster threatens the entire health industry. A large part of the fault lies with the "Medical Industrial Complex," his name for the interlocking corporations—often huge conglomerates—that furnish drugs, medical equipment, and supplies, but also own and administer hospitals and other health facilities, including nursing homes and walk-in clinics

The profit motive rules. Decisions are made with an eye to profits and the interests of the shareholders rather than of the patients or physicians Corporations, by owning and operating hospitals and hiring doctors to do the work, are, thinks Wohl, practicing medicine In all this the "quality of care" suffers, for doctors are ceasing to exert influence.

The care of the sick has become too expensive The corporations would make this worse, for they want to increase utilization of tests and of expensive equipment, for therein lies the profit Wohl does not hold the physicians blameless and often reproaches them mildly for their greed, but he still maintains a firm belief in the idealism of physicians

To document the vast abuses Wohl points to the present status of emergency medicine and the way it has become largely the handmaiden of the corporations in their search for profits. He also points to the Wall Street interest in genetic engineering as an area for public investment and lay management. Many other potential horrors Wohl dutifully views with alarm, sometimes with the help of purple rhetoric. He does admit the role of government expenditures and the presence of politically sensitive problems.

The book is superficial. The major interest seems to be the documentation of corporate interests in health matters. Various statistical data and other compilations occupy a large part of the book. References are practically worthless, for they are not keyed and it is virtually impossible to find validation for particular statements

Suggestions for remedies are feeble indeed and go little beyond the pious statements that the government, the medical-industrial complex, and the doctors must all work together Dogmatism alternates with feeble assertions to the effect, "It seems to me that . "

Altogether, the volume is moderately effective journalism of the muckraking variety, that calls attention to important problems and abuses, without offering scholarly analysis or deeper understanding

Reviewed by LESTER S KING, Contributing editor to the *Journal of the American Medical Association*, Chicago, Illinois.

THE BULLETIN RECENTLY RECEIVED

Agustín Albarracín Teulón. *La teoría celular historia de un paradigma* Madrid Alianza Editorial, 1983 298 pp

William Ray Arney and Bernard J Bergen *Medicine and the Management of Living: Taming the Last Great Beast* Chicago and London. University of Chicago Press, 1984. 202 pp. $19.95

Ernst Baümler *Paul Ehrlich. Scientist for Life.* Translated by Grant Edwards. New York and London Holmes & Meier, 1984 xvi + 288 pp. Ill. $39.50

Robert Boakes. *From Darwin to Behaviourism: Psychology and the Minds of Animals* Cambridge and New York: Cambridge University Press, 1984. xiv + 279 pp. Ill. $69.50 (cloth), $19.95 (paperbound)

William Budd *On the Causes of Fevers (1839)* Edited by Dale C Smith. Baltimore. The Johns Hopkins University Press, 1984 (Henry E. Sigerist Supplements to the *Bulletin of the History of Medicine,* new series, no 9) xi + 164 pp $9.95 (paperbound).

Stanley B Burns *Early Medical Photography in America (1839–1883)* Reprinted from the *New York State Medical Journal* New York. The Burns Archives, 1983. viii + 124 pp Ill $85.00

Benjamin Castleman, David C Crockett and S. B Sutton (eds) *The Massachusetts General Hospital, 1955–1980* Boston and Toronto Little, Brown, 1983 xxii + 410 pp $22.95.

Carleton B. Chapman *Physicians, Law and Ethics* New York and London. New York University Press, 1984 xviii + 192 pp Ill $25.00 (cloth), $10.00 (paperbound) (Distributed by Columbia University Press).

Thomas S Chen and Peter S. Chen *Understanding the Liver: A History* Westport, Conn. and London: Greenwood Press, 1984 (Contributions in Medical History, no. 14). 293 pp. $45.00.

Helen Clapesattle. *Dr Webb of Colorado Springs* Boulder, Colorado· Colorado Associated University Press, 1984. xi + 507 pp. Ill. $19.50.

F. W. P. Dougherty (comp.). *Commercivm Epistolicvm J F Blvmenbachii. Aus einem Briefwechsel des klassischen Zeitalters der Naturgeschichte* Göttingen: Niedersächsischen Staats- und Universitätsbibliothek Göttingen, 1984. 220 pp Ill. DM24,00 (paperbound). (Order from Niedersächsischen Staats- und Universitätsbibliothek, Prinzenstrasse 1, 3400 Göttingen, West Germany)

Jonathon Erlen (comp) *The History of the Health Care Sciences and Health Care, 1700–1980 A Selective Annotated Bibliography* New York and London: Garland Publishing, 1984. xvi + 1,028 pp. $100.00

Bryan Gandevia, Alison Holster and Sheila Simpson (comps). *An Annotated Bibliography of the History of Medicine and Health in Australia* Sydney: Royal Australasian College of Physicians, 1984. xiv + 187 pp $38.50 (Australian)

Michael Gelfand. *Christian Doctor and Nurse. The History of Medical Missions in South Africa from 1799–1976.* Athol, Sandton, South Africa: Privately published, 1984 347 pp Ill R33,00. (Order from *Christian Doctor and Nurse,* 93 East Avenue, Athol, Sandton 2196, Republic of South Africa)

Mark Graubard. *Witchcraft and the Nature of Man.* Lanham, Maryland. University Press of America, 1984 317 pp $25.50 (cloth), $14.75 (paperbound)

Wolfgang-Hagen Hein (ed.) *Botanical Drugs of the Americas in the Old and New Worlds: Invitational Symposium at the Washington Congress, 1983* (Veroffentlichungen der Internationalen Gesellschaft fur Geschichte der Pharmazie, no. 53) Stuttgart: Wissenschaftliche Verlagsgesellschaft, 1984. 131 pp. (Text in English and German). $3.50 (Distributed by American Institute of the History of Pharmacy, Madison, Wisconsin).

J. B. Lamarck. *Zoological Philosophy: An Exposition with Regard to the Natural History of Animals.* Translated by Hugh Elliot. Chicago and London: University of Chicago Press, 1984. lxvi + 453 pp. $30.00 (cloth), $15.00 (paperbound).

W. R. LeFanu (comp.) *British Periodicals of Medicine: A Chronological List, 1640–1899* (revised edition). Edited by Jean Loudon. Oxford: Wellcome Unit for the History of Medicine, 1984. xi + 67 pp. $5.00 (paperbound).

Dorothy Levenson. *Montefiore: The Hospital as Social Instrument, 1884–1984.* New York: Farrar, Straus & Giroux, 1984. 338 pp. $19.95.

G. A. Lindeboom. *Dutch Medical Biography: A Biographical Dictionary of Dutch Physicians and Surgeons, 1475–1975.* Amsterdam: Rodopi, 1984. xiii + 1,130 pp. $136.75.

Teizo Ogawa (ed.). *History of Obstetrics: Proceedings of the 7th International Symposium on the Comparative History of Medicine—East and West.* Tokyo: Taniguchi Foundation, 1983. ix + 283 pp. (Distributed by Maruzen Company, Ltd., 2-3-10 Nihonbashi, Chuo-ku, Tokyo 102, Japan).

Thomas Palmer. *The Admirable Secrets of Physick and Chyrurgery.* Edited by Thomas Rogers Forbes. New Haven, Conn.: Yale University Press, 1984. x + 221 pp. Ill. $25.00.

T. V. N. Persaud. *Early History of Human Anatomy: From Antiquity to the Beginning of the Modern Era.* Springfield, Illinois: Charles C Thomas, 1984. ix + 200 pp. Ill. $24.75.

Graham Rees, assisted by Christopher Upton. *Francis Bacon's Natural Philosophy. A New Source* (A transcription of Manuscript Hardwick 72A with translation and commentary). Chalfont St. Giles, Bucks.: British Society for the History of Science, 1984. 197 pp. £7.90, US $12.50.

Barry Reisman. *Jared's Story: A Boy in a Bubble and How His Family Saved His Life.* New York: Crown, 1984. 185 pp. $10.95.

John Richardson. *Arctic Ordeal: The Journal of John Richardson, Surgeon-Naturalist with Franklin, 1820–1822.* Edited by C. Stuart Houston. Kingston and Montreal: McGill-Queen's University Press, 1984. xxxiii + 349 pp. $29.95 (Canadian).

Agustín Rubio Vela. *Pobreza, enfermedad y asistencia hospitalaria en la Valencia del siglo XIV.* Valencia, Spain: Institución Alfonso el Magnánimo, Diputación Provincial de Valencia, 1984. 255 pp. Pta. 1,000 (Order from Servei de Publicacións, Diputación Provincial de Valencia, Corona 36, Valencia, Spain).

William McKinley Runyan. *Life Histories and Psychobiography. Explorations in Theory and Method.* Oxford and New York: Oxford University Press, 1984. xiii + 288 pp. $19.95 (cloth); $9.95 (paperbound).

G. Sabbah (ed.). *Memoires V. Textes médicaux latins antiques.* Saint-Etienne, France: Publications de l'Université de Saint-Etienne for the Centre Jean Palerne, 1984. 163 pp.

Clement A. Smith. *The Children's Hospital of Boston. "Built Better Than They Knew."* Boston and Toronto: Little, Brown, 1983. ix + 284 pp. Ill. $16.95 (paperbound).

Dorothy A. Stansfield *Thomas Beddoes, M.D., 1760–1808 Chemist, Physician, Democrat* Dordrecht-Boston-Lancaster. D Reidel, 1984 xix + 306 pp Dfl. 140,00, $54.00

Ulrich Tröhler *Der Nobelpreistrager Theodor Kocher, 1841–1917* Basel-Boston-Stuttgart: Birkhauser, 1984 xvi + 240 pp Ill Sw. Fr. 39,80

Richard P Wedeen *Poison in the Pot The Legacy of Lead* Carbondale and Edwardsville. Southern Illinois University Press, 1984 xi + 274 pp Ill $24.95

Benjamin V. White *Stanley Cobb A Builder of the Modern Neurosciences* Boston Francis Countway Library of Medicine, 1984. xv + 445 pp. $29 50. (Order from University Press of Virginia, Box 3608, University Station, Charlottesville, Virginia 22903)

Leonard Zusne *Biographical Dictionary of Psychology* Westport, Conn.: Greenwood Press, 1984 xxi + 563 pp $49 95.

CONTRIBUTORS TO THIS NUMBER

JOHN F. BENTON, Ph.D, is professor of history at the California Institute of Technology, Pasadena, California 91125. He has long been interested in the relationship between literature and social history, but took up the subject of this article only after one of his daughters became an M.D. He is now preparing a reprint of Elizabeth Mason Hohl's translation of *The Diseases of Women by Trotula of Salerno,* to be published with a new introduction by the University of Toronto Press.

JAMES D GOODYEAR is a postdoctoral fellow in the Program for Atlantic History, Culture and Society at the Johns Hopkins University. Among his research interests are the origin of the idea of tropical disease, and the recent history of socio-economic development policies on health and health care in the Third World, especially Brazil. His address is Department of History, The Johns Hopkins University, 34th and Charles Streets, Baltimore, Maryland 21218

ARTHUR E IMHOF, Ph D., is professor of social history at the Friedrich-Meinecke-Institut, Freie Universitat Berlin, Habelschwerdter Allee 45, 1000 Berlin 33, West Germany His recent publications include *Die gewonnenen Jahre. Von der Zunahme unserer keit einer neuen Einstellung zu Leben und Sterben* (Munich: C H. Beck, 1981) and *Die verlorenen Welten: Alltagsbewaltigung durch unsere Vorfahren und weshalb wir uns heute so schwer damit tun* (Munich. C H Beck, 1984). A peripatetic lecturer, he has held visiting professorships at the Ecole des Hautes Etudes en Sciences Sociales, Paris, the Hebrew University of Jerusalem, and most recently, the universities at São Paulo and Curitiba, Brazil.

ROBERT E. KOHLER, Ph.D., is an associate professor in the Department of the History and Sociology of Science, E. F. Smith Hall D6, University of Pennsylvania, Philadelphia 19104 and the author of *From Medical Chemistry to Biochemistry The Making of a Biomedical Discipline* (Cambridge: Cambridge University Press, 1982) His research interests include American science and medicine, philanthropy and science, and biomedical science.

SUSAN C LAWRENCE is a doctoral student at the Institute for the History and Philosophy of Science and Technology, University of Toronto. She is currently completing her dissertation on the development of clinical teaching and research at the London hospitals between 1750 and 1815. Her address is 46 Brunswick Avenue, Toronto, Ontario M5S 2L7, Canada

W. E. KNOWLES MIDDLETON retired from the National Research Council of Canada in 1963, and since then has published books and papers on the history of meteorological instruments, seventeenth–century Italian science, and more recently, on the history of some of the Divisions of the National Research Council of Canada His address is 2020 Haro Street, Apartment 2406, Vancouver, B C V6G 1J3, Canada

JOSÉ G. RIGAU-PÉREZ, M.D., is an epidemiologist with the Field Services Division, Centers for Disease Control, U S Public Health Service He is currently on assignment as Director of the Division of Epidemiology at the Puerto Rico Department of Health, GPO Box 71423, San Juan, Puerto Rico 00936

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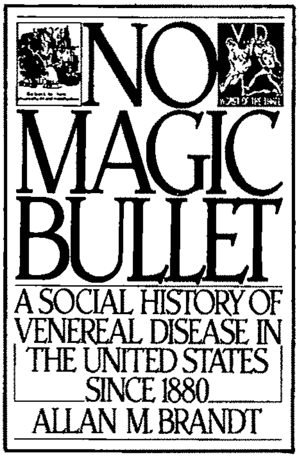

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Ann-Louise Shapiro

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Improved low-cost housing became a priority for reformers of several kinds, Shapiro argues, because it seemed the most promising way to disinfect and pacify the working class. Housing reform strategies, in all their various guises, promised nothing less than the reduction of social tensions, the promotion of public health, the moral education of the workers, and the guarantee of public order.

In the end, these ideals would prove disturbingly elusive. The persistent shortage of working-class housing called into doubt optimistic forecasts of continuing economic advance for what was, in fact, a growing, impoverished, and increasingly politicized lower class. The reformers, Shapiro argues, were forced to re-examine accepted dogmas and cherished assumptions. Most important, the issue of working-class housing posed broad questions about the government's responsibility for the general welfare, the proper balance between public and private interests, and the role of public subsidies in a free market. Moreover, a new group of hygienists, claiming their rights as technical experts, emerged to challenge the authority of local politicians over health issues.

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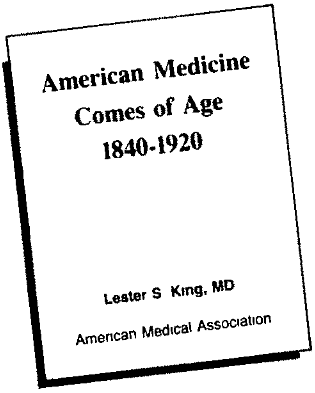

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Lester S King, MD

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Dr King's other books include *The Growth of Medical Thought, The Road to Medical Enlightenment, The Philosophy of Medicine,* and *Medical Thinking: A Historical Preface*

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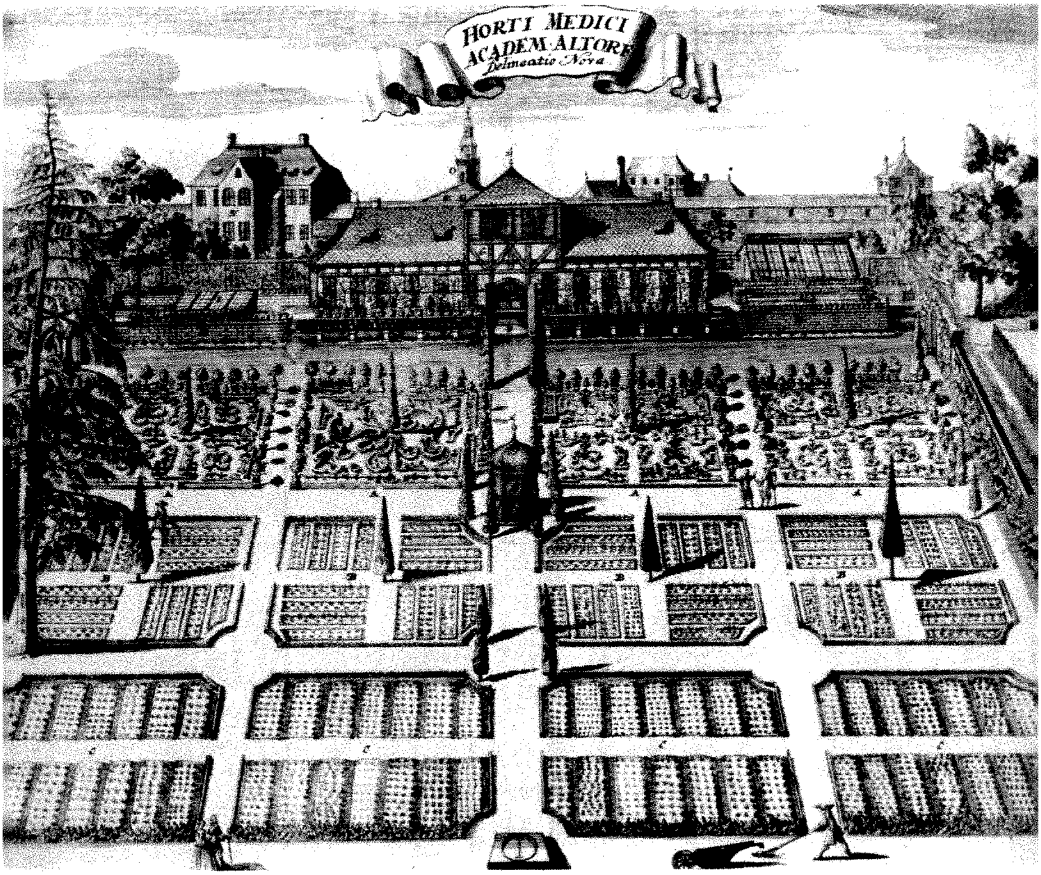

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Dr Edward C Atwater
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THE TROUBLE WITH BOVINE TUBERCULOSIS*

Barbara Gutmann Rosenkrantz

Scientific and popular concern with the relation between disease in animals and disease in humans long antedates the identification of specific microbial organisms causing contagious diseases. By the mid-nineteenth century, experiments had demonstrated that tuberculous matter could infect both cows and men through inoculation, and, at the end of the century, scientific investigations of the "Coincidental Geographical Distribution of Tuberculosis and Dairy Cattle" produced a medical literature supporting the ancient hypothesis that tuberculosis originated in domesticated cattle and was transmitted to man through milk and meat. According to such eminent authorities as Emil von Behring, there was no tuberculosis among primitive people who did not keep dairy cattle. As history progressed, humans became a "veritable parasite" to "the bovine race," a situation that entailed interdependence.[1] With this background it is not surprising that old-line hygienists and the new stream of cattle bureau chiefs trained in the latest science agreed that disease shared by man and beast promoted common rather than contesting interests. It could be said that Koch's 1882 discovery of the tubercle bacillus finally made it possible to confirm previous impressionistic evidence that tuberculosis was a disease afflicting both animal and human populations.[2] But this association was challenged in the course of the international campaign to conquer the Great White Plague. As the potential social and economic costs as well as the benefits of controlling the contagion of tuberculosis became more obvious in the early twentieth century, conflicts among its would-be conquerors tended to surface.

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*An early version of this paper "Koch's Bacillus and Its Kin. A Case of Sibling Rivalry" was delivered on 3 June 1983 at the Symposium on Disease in History in honor of Lloyd Stevenson on his retirement as Director of the Institute of the History of Medicine, The Johns Hopkins University I want to thank William Johnston, Mark Peterson, and Eric D Brandfonbrener for research assistance, Elin Wolfe for calling my attention to papers concerning the short-lived Harvard Veterinary School (1882–1901), and Harry Marks for typically perceptive comments This paper was revised while I was a Fellow at the Center for Advanced Study in the Behavioral Sciences (1983–84) and I am grateful for support provided by the National Endowment for the Humanities FC 20029 and the Andrew Mellon Foundation.

[1] Edward F Brush, *The Association of Human and Bovine Tuberculosis* (Mt. Vernon, New York, 1898) This is a collection of papers which originally appeared in the *New York Medical Journal*, 1888–92 The paper referred to here was first published 8 March 1890 and asserts "After due deliberation and serious study, both as a physician and as a cattle breeder, I am firmly of the opinion that the blessings conferred on us by the bovine tribe far outweigh the burden of the disease they have entailed on us . Deeming it, however, quite possible to breed animals without any scrofulous taint, and in lieu of the burden of disease assume the burden of heavier financial expense, I earnestly urge reform." Harold C Ernst quotes Brush and mentions the debate over the costs and benefits of slaughtering diseased dairy cattle carried on in the *Boston Medical and Surgical Journal* in *How Far May a Cow be Tuberculous Before her Milk Becomes Dangerous as an Article of Food* (Amherst, Mass · Press of the Amherst Record, 1889) Ernst's paper was read originally to the Association of American Physicians and was also published in the *Amer J Med. Sci*, 1889, *98* 439–51

Controversy over the association of bovine and human tuberculosis attracted public notice as differences of opinion among well-known scientific experts were aired in the press. On two particular occasions, at meetings of the International Congress on Tuberculosis in London in 1901 and again at a subsequent Congress in Washington, D.C., in 1908, Robert Koch was the target of angry outbursts after presenting scientific papers in which he maintained that the bacillus responsible for tuberculous disease in cattle and poultry differed from the bacillus of human pulmonary tuberculosis and that transmission of tuberculosis from cattle to humans was, therefore, negligible and possibly even non-existent. Originally in 1882, Koch had argued that the same organism caused tuberculosis in humans and animals, although the bacilli from cattle transmitted to humans through meat and milk were not as virulent as the bacilli transmitted from human pulmonary disease carried in "phthistic sputum." Koch considered milk probably free of danger unless the cow's udder was the site of disease. Nonetheless, despite such reservations, Koch had warned "If infection from domestic animals in general does not appear to be frequent, it must by no means be underrated."[3]

In the decade following, while public health investigators and veterinarians in many countries emphasized the dangers of bovine tuberculosis for both cattle and human health, sometimes suggesting that Koch had underestimated the threat, research on the morphological characteristics of the tubercle bacillus continued. In 1896, in the context of his studies in comparative pathology, the American bacteriologist Theobald Smith published the results of empirical work demonstrating distinctions among bovine, avian, and human tubercle bacilli.[4] At the London Congress in 1901, Robert Koch explained that it was because the human and bovine bacillus differed that he had concluded disease transmitted through milk was of little significance for human health. Smith's findings—true or false, acclaimed or ignored—were not the bone of contention; instead, Koch's insistence that it was necessary to mount a single-minded campaign against pulmonary tuberculosis was damned as disruptive because he dismissed the threat of tuberculosis transmitted through infected milk and meat as inconsequential.[5] Frederick Hoffman, the German-born statistician who was an American delegate to the London Congress, thought that Koch took "undue advantage" of his prominence when he provoked a dispute that overshadowed the other proceedings of the Congress. "It was a statement that could have been made at any time before a scientific society in Germany or by a communication to a medical publication," but not at an international gathering in front of 2,000 delegates, reported Hoffman to the American Congress of Tuberculosis when it met later that year in New York City.[6] At the Washington meetings in 1908, the hubbub was even louder. A newspaper correspondent reported that "Dr. Koch stands almost alone in his avowal that 'up to date in no case of pulmonary tuberculosis has the tubercle bacillus of the bovine type been definitely demonstrated.' " The *Washington Post* dramatically announced "Koch Stands Fast, Asks to be Protected" in headlines over a column disclosing that a special meeting had been called to assess the incidence of bovine type tuberculosis in man and the presence of human type bacilli in cattle. Meanwhile, the pediatrician Abraham Jacobi was quoted as saying in "retort" that "The lives of the thousands of babies in the world are far more important than the reputation of one scientist."[7]

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[2] William H Park and Charles Krumwiede, Jr., "The relative importance of the bovine and human types of tuberculosis," *J Med. Research,* n.s 1910, *18* 207, introduce their paper with a brief historical review in which they suggest that Koch "apparently settled" an ongoing inquiry about the unity of tuberculous disease They continue, "Although differences in virulence were noticed in material from man and cattle, and had been noticed even before the discovery of the tubercle bacillus, they raised no doubt as to the complete identity and intercommunicability of the disease" Many articles on bovine tuberculosis in this period began with a review of history, typically citing Klencke's (1843) and Villemin's (1865) experimental evidence of a single disease as pioneering research

[3] From "Die Aetiologie der Tuberkulose," *Mittheilungen aus dem Kaiserliche Gesundheitsamt,* 1884, *2* 1–88 The paper was translated in the *Amer Vet Rev*, 1889, *13*: 54–82, 104–30, 148–71, 197–214 The quote is on p. 212 Koch reminds his readers of the obstacles to demonstrating the transmission of tuberculosis between cattle and human populations and concludes "If in the course of further investigations again a difference between the *perlsucht* and the tuberculous bacilli should show itself, which would compel us to consider the same as only near relations, we should even then have all cause to hold the *perlsucht* bacilli as suspicious in the highest degree From the hygienic standpoint the same measures must be taken against it as against the infection through tuberculous bacilli, so long as it is not proved that man can bring *perlsucht* bacilli in contact with skin-wounds without danger, that he can inhale the same or bring their spores into his intestinal canal without becoming tuberculous" (p. 212)

[4] Frederick H. Osgood, professor of veterinary surgery at the Harvard School of Veterinary Medicine insisted that Koch's "misleading" words on the bovine tubercle bacillus were "capable of doing incalculable

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harm if allowed application in practice in the arrangement of our cattle" See his "Tuberculosis in cattle," *Boston Med. Surg J*, 1894, *131* 56 *The Annual Report* (1899) of the Massachusetts Board of Cattle Commissioners typically cited the report of the British Royal Commission (1895) and the work of Bernhard Bang in Denmark to strengthen its claim to a sizable legislative appropriation. Theobald Smith is quoted suggesting that "If the evidence gained by pathology in the future should reveal a greater danger than is here assumed, the scientific basis of such evidence will, I think, force all additional measures needed" For the moment, however, Smith supported a relatively modest quarantine. See *Mass Pub Doc. Ser* (1899), *51* 29 See also Smith, "Two varieties of the tubercle bacillus from mammals," *Trans Assoc. Amer Phys*, 1896, *11* 75–93, "Comparative study of bovine tubercle bacilli and human bacilli from sputum," *ibid*, 1898, *13* 417–70 and *J Exper Med*, 1898, *3* 451–511.

[5] Koch's paper title in London was "The combatting of tuberculosis in the light of experience that has been gained in the successful combatting of other infectious diseases," *Brit Med J*, 1901, *2* 189–93 Variants of this title were used in other English language republications, see *Nature*, 1901, *64* 312–16, and Clark Bell's report to the second annual meeting of the American Congress of Tuberculosis, *Bulletin of the Medico-Legal Congress* (New York), 1902 British scientific and popular reaction was particularly hostile, in part because of recent Parliamentary Commission investigations which had led to legislation against the sale of milk and meat from infected animals Koch reiterated his views "Ubertragbarkeit der Rindertuberkulose auf den Menschen," *Deutsche Medizinische Wochenschrift*, 1902, *28*· 857–62, translated in the *Brit Med J*, 1902, *2* 885–89

[6] "The work of the London Congress of Tuberculosis and discussions of the reports of delegates," *Bull Med-Leg Cong*, 1902, 209–10 See also "Human and animal tuberculosis," editorial in the *Independent* (NY), 1902, *54* 1674–75 For another eyewitness report, see Nathan Raw, *The Control of Bovine Tuberculosis in Man* (London Baillière, Tindall, and Cox, 1937), pp 23–24

[7] Koch started the discussion in Washington with his paper "The relation of human and bovine tuberculosis," *Trans. Sixth Int Cong Tuber.*, 1908, *4* 645–50 He assigned to Theobald Smith "the credit of having been the first to call attention to certain differences between the tubercle bacilli found in man and in cattle"

Although the American press made much of the contest that took place in the closed meeting of delegates to the joint session on "The Relations of Tuberculosis of Animals and of Man," strictly speaking, the minutes of that meeting show no disagreements about the transmission of disease from cattle to humans. There were, however, significant differences about methods of experimentation and the social relations of science. With respect to method one could identify two camps. On the one hand, there were those who like Theobald Smith agreed with Koch that methods of investigation had changed so drastically over the past ten or fifteen years that "in a problem of such importance as this, where the existing evidence may be made to point in both ways, we must begin over again in the collection of scientific evidence."[8] At the beginning of the century Smith had presented biologists with a series of fundamental questions that were not fully answered through observation and experiment. Speaking before a meeting of physicians about adaptation in microbial organisms Smith had asked, "What relation exists between the human and the bovine plague? Evidently not an indiscriminate one." He had continued, "Does the latter furnish the human race from time to time with bacilli of high potency to take the place of attenuated forms that thrive saprophytically in the lungs? Or is the specific adaptation of the two forms such that any relationship worth consideration no longer exists?"[9] Difficulties establishing the limits of variability for the tubercle bacillus and determining under what conditions attenuated virulence occurred were compounded by technical limitations which were, to Koch and Smith among others, more obvious over time. A contrary position was represented by Albert Calmette when he found fault with the implications of this theoretically oriented research style. Along with Calmette, a number of delegates from France and England at the Congress maintained that clinical evidence supported the theory that the tubercle bacillus was pleomorphic. "This transformation," Calmette argued, "like those of different micro-organisms in different animals, is brought about by prolonged sojourn in each species of animals, the bovine bacillus in chronic tuberculosis of lungs in man being transformed into the human type, and frequently this infection has occurred in the mesenteric glands of children, thus permitting the finding of the bovine tubercle bacillus there."[10]

Without referring directly to the London meetings, Koch said "Many of my opponents have made strenuous efforts to prove that the tubercle bacilli in man and those in cattle cannot be of different species, and they imagine that they can thus refute my contentions . . I have never held that we are dealing with two distinct species, but have only stated that they differ from each other in certain characteristics, characteristics which are of the greatest importance in combatting tuberculosis" See also the *Washington Post*, 3 October 1908 Although excerpts from the minutes of the closed meeting were published in the *JAMA*, 1908, *51*. 1257–60, the story was presumably leaked to the daily press This is the source of the quotation, "Dr Koch isolated the tubercle bacilli today science isolated Dr Koch!" in C E-A Winslow's *The Life of Hermann M Biggs* (Philadelphia. Lea & Febiger, 1928), p 218 See also *Trans. Sixth Int Cong Tuber*, 1908, *4* 741–56

[8] *Trans Sixth Int Cong Tuber*, 1908, *4* 745

[9] "Bacteriology in health and disease, adaptation of pathogenic bacteria to different species of animals," *Trans Cong Amer Phys*, 1900, *5* 10 It is worth noting that Koch frequently imputed personal rather than professional motives to his opponents, which further excited public interest.

[10] *Trans Sixth Int Cong Tuber*, 1908, *4* 749–50

The potential for these differences over methods of investigation and sources of evidence becoming exaggerated was realized in the heightened atmosphere of an early twentieth-century international scientific congress. Koch's insistence that this was a "purely scientific subject," led him to oppose the inclination of other delegates to present a resolution on the relations of bovine and human tuberculosis for a vote at the plenary session. And when Koch indignantly protested that he would not vote since "We are speaking of objective facts and not of subjective views," this was reckoned by the American public as a sign of his intransigence and conceit, and many delegates felt that Koch's words amounted to the sabotage of practical measures to protect the public health.[11]

Surprisingly, few delegates made the case that medical, public health, and social programs for controlling the contagion of pulmonary tuberculosis might be advanced by association with campaigns to eliminate tuberculosis in cattle. So the debate swung back and forth between arguments about scientific evidence concerning the morphological and biological characteristics of the tubercle bacillus and disagreements about who and what should determine the measures that were proper to protect the public from infected milk and meat. The question of how much tuberculosis was actually transmitted from cows to humans was lost sight of in the middle of acrimonious arguments. Inevitably, the question of the prevalence of disease caused by the bovine tubercle in humans was confounded with questions of the extent of bovine disease. Veranus Moore, professor of veterinary medicine at Cornell, observed, moreover, that veterinarians reported more tuberculosis in animals than did cattle men. A cautious veterinarian could reasonably acknowledge that it was "an impossibility to get any statistics to show the extent to which this malady exists among our bovine population," and simultaneously propose that "The relation that milk use bears to the malady in mankind will never be known until thorough steps are taken to prevent its use."[12]

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[11] *Ibid*, pp 755–56 From our perspective Koch appears the soul of reason. Following Koch's objections, two English delegates asked that the Congress get on with "practical problems" since "we cannot settle these scientific questions definitely," and proposed that a series of programmatic resolutions on bovine tuberculosis and the danger of transmission to children through milk be forwarded to the general meeting of the Congress Again Koch objected "We have not at all discussed this subject; how can resolutions of purely practical importance be brought about in this meeting on things we have not discussed to-day? I shall abstain from any resolution." When, after lengthy discussion, there was a motion to prepare a report of the meeting in the form of shorthand minutes, Koch readily agreed, saying "I shall not have the slightest objection to the publication of an exact report of this meeting Why should I object to the statement that I recognize the transmissibility of bovine tuberculosis to man?" See also Barbara Gutmann Rosenkrantz, "Koch's Bacillus. Was There a Technological Fix?" in Edna Ullmann-Margalit, ed., *The Prisms of Science The Israel Colloquium Studies in History, Philosophy, and Sociology of Science,* no 2 (Atlantic Highlands, NJ Humanities Press, 1985), pp 147–60

[12] *Trans. Sixth Int Cong Tuber*, 1908, *4* 532 Moore's comments are part of the discussion of a paper on the New York City milk supply in which there were significant disagreements between Theobald Smith and Macyzk P Ravenel on the extent of human infection from bovine sources See also Austin Peters, "Prevalence of bovine tuberculosis," *Boston Med Surg J*, 1894, *131* 525–26 Peters was skeptical about the accuracy of reports in part because he believed many state and city boards were corrupt. Reports of the prevalence of tuberculosis in United States herds ran from 8 to 35 percent. Peters also objected to slaughtering infected cattle in the absence of a program to eliminate re-infection, singling out "contamination from

Assessment of the extent of human infection reflected unspoken convictions about the conditions that engendered susceptibility and the sources of infection. In October 1901, the Suffolk (Massachusetts) Medical Society was host to A. D. Blackader of McGill Medical School, who reported great variation in mortality rates from tuberculosis among European, English, Canadian, and American children. Blackader suggested that the difference between English autopsy reports showing that 25 to 30 percent of childhood tuberculosis was associated with bovine tubercle bacilli, and reports from the United States, where 7 to 8 percent was the more typical figure, came about because both cattle and children lived in a better environment in America. After evaluating these reports and the variation in prevalence they reflected, Blackader concluded that the danger of infection from milk was exaggerated. In the discussion that followed, Theobald Smith agreed with the speaker but noted that physicians had been guilty of neglecting infected milk as a reservoir of disease, while public health enthusiasts were overly eager to act without adequate knowledge of the actual danger involved.[13]

By the end of the decade, no one questioned that pulmonary tuberculosis transmitted from active human cases accounted for "eleven-twelfths" of all tuberculosis deaths, but careful studies established that 10 percent of the deaths among infants and young children in American cities could be attributed to disease from milk.[14] There was, as always, the assumption that some of the higher rates directly reflected poverty or some other environmental variable, and attributions of responsibility to the poor quality of milk vied with hints that maternal laxity was at fault, a combination of these disadvantages gradually replacing heredity as a simultaneously predisposing and pre-

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consumptive persons" as a specific source of danger to cattle "If we start a crusade against the poor cow, without taking any other precautions to guard against it, we shall be simply continuing to prevent a waste at the spigot while there is a big leak at the bung"

[13] A. D Blackader, "A discussion of the relation between human and bovine tuberculosis, with special reference to primary infection in children through the alimentary canal," *Boston Med. Surg J*, 1901, *145* 668–69. Smith cited his own 1896 and 1898 papers as "instrumental in checking in many states the efforts to go to extreme measures in the eradication of bovine disease," until there was "a firmer scientific basis," *ibid*, p 680 An editorial in the same journal earlier in the year commented on Koch's London paper with tolerance "the value of such assertions from a man of eminence lies in the renewed stimulus it gives to research in any way bearing on the issue," *ibid*, pp 135–36 See also George M. Kober, "The transmission of bovine tuberculosis in milk, with a tabulation of eighty-six cases," *Trans Assoc. Amer Phys*, 1903, *18* 15, 17

[14] "Eleven-twelfths" is the figure given by Koch when he protested the folly of a major campaign against bovine disease, see *Trans Sixth Int Cong Tuber*, 1908, *4* 754 J George Adami, "On the significance of bovine tuberculosis and its eradication and prevention in Canada," *Phila. Med. J*, 1899, *4* 1277–84 gives data for Bavaria, Saxony, Berlin, and Leipzig as well as for Canada. For a layman's estimate see "The cow and human tuberculosis," editorial in the *Independent* (N Y), 1911, *71* 158–60 Park and Krumwiede, "Relative importance" summarizes much of their own work and that of other investigators See also Department of Health, New York City, *Collected Studies from the Research Laboratory*, 1911, *6* 73–131, and William H Park, "The types of tubercle bacilli present in eighty-four cases of human tuberculosis in New York City," *Trans Sixth Int Cong Tuber*, 1908, *4*. 697–73, and "The role of bovine tuberculosis in the production of human tuberculosis," *Trans Fifteenth Int Cong Hyg Demog*, 1912, *1* 267–78 Milton J Rosenau reviewed a number of European and American studies in the N W Harris Lectures delivered at Northwestern University and published as *The Milk Question* (Boston and New York. Houghton, Mifflin, 1912), see especially pp 93–112. See also E. C Schroeder, "Some facts about tuberculosis in cattle," *United States Department of Agriculture Yearbook*, 1908 (Washington, D C G P.O , 1908), pp 217–26

cipitating force. Understandably, when social circumstance could play an important role in determining susceptibility or exposure, moral and medical sensibilities were offended by Koch's uncompromising stand. It was unthinkable that infants and children should not be protected by removing infected milk and tainted meat from the market place.

Yet, as Theobald Smith noted, "the whole machinery of public health was suddenly and rudely shaken" by the argument that milk was a minor culprit in the incidence of tuberculosis. Virtually every industrialized nation hailed its own hard-won public health achievements, and laws to restrict pollution of water and adulteration of food were frequently the foundation of later, and less welcome, mandates of state regulatory authority. Nineteenth-century sanitarians had made the connection between personal and public hygiene, successfully linking exhortation and explanation.[15] But within a few decades of the discovery of the tubercle bacillus, the ambiguities of cause and condition, the commitments to cleanliness and purity that had served sanitarians so well were suspect. A veterinary inspector from upstate New York pointed out that tuberculous infection of cattle was no respecter of place. After testing Levi P. Morton's herd, he commented that if the owner "should turn the White House in Washington into a cow-stable, we could not have better sanitary conditions," yet, twenty-three out of Morton's sixty-two cows had to be slaughtered because of disease. Entangled in this bold statement was the unwelcome (and probably unintended) capitulation to the view that the microbe was the sole agent of disease.[16] Whatever the immediate lesson, the ambiguities that were shaded by such a potentially reductionist conclusion were easier to ignore in the barn than in the home. Physicians, sanitarians and bacteriologists were more visibly perplexed and vexed than were veterinarians by the practical consequences of treating the tubercle bacillus as the essential cause of tuberculosis. The difficulty of tightly linking infection to disease was, for example, exacerbated by the impossibility of rigorously establishing the conditions under which exposure led to illness. Although tuberculosis in cattle offered a more neutral environment in which to explore these complex questions, the campaign against bovine tuberculosis could be seen as a capricious distortion of priorities, a battle that might undercut public support for medical and public health programs against human tuberculosis, the most fatal disease transmitted from man to man.

One interested party emerged from this controversy to claim unique competence. The veterinary profession was in the throes of sorting out its own competing schools, journals, and authority, but by 1880 there was no mistaking the Doctor of Veterinary Medicine for the "cow leech." With contagious pleuropneumonia in cattle virtually eliminated in some states as a result of quarantine enforcement in which veterinarians played a key role, the National Board of Health asked James Law, a veterinarian from Cornell, to submit a report on the diseases of animals. When Law identified bovine tuberculosis as the most important of the zoonoses, he also expressed his opinion that the new Board should embrace "a superintendence of the sanitary condition of the domestic animals," emphasizing the need to promote the public health through the collaboration of human and animal medicine. All veterinarians were not, however, united in their confidence in the medical profession and the *American Veterinary Review,* and even the *Archives of Comparative and General Medicine and Surgery,* regularly compounded and dispensed evidence of the superior scientific and social qualifications of veterinary practitioners.[17] When comparing the veterinarian and the physician, these journals generally accentuated the limitations of medical training and specialty practice. "[T]here are men who do not go beyond the diseases of the lungs and throat, and not a few delve deeply into the mysteries and intricacies of the wonderful nervous system to the exclusion of every other phase of medicine," an editor complained in 1898. The veterinarian's intellectual foundation and experience was by comparison intentionally comprehensive, assuring "versatility." Accordingly, the reader was reminded that "Cattle practice, with many diseases not known in any other species of animal, is the chief reliance of many of the members of our profession; and with this branch more than with any other, the demands of sanitary medicine are most pronounced."[18] It followed that the veterinarian was intimate with the complexities of bacteriology and could follow the path winding between the laboratory and the actual disease.

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[15] See Charles E Rosenberg, "Florence Nightingale on Contagion The Hospital as Moral Universe," in Rosenberg, ed., *Healing and History: Essays for George Rosen* (New York Science History Publications, 1979), and "Medicine and community in Victorian Britain," *J Interdis. Hist*, 1981, *11*: 677–84, essay review of John M. Eyler, *Victorian Social Medicine The Ideas and Methods of William Farr*, and Margaret Pelling, *Cholera, Fever and English Medicine, 1825–1865*

[16] James Faust's invited comments at a meeting of the Massachusetts Veterinary Association were not intended to undermine adherence to cleanliness, because "as veterinarians, we should have as much regard to sanitary conditions as the medical profession." His remarks were offered in the context of the early debate over the value of tuberculin to show that apparent cleanliness was not a sufficient guarantee of freedom from disease. See "Reports of Societies," *Boston Med. Surg J*, 1894, *131* 537

Although taught that the growth of knowledge in animal science followed that in the human medical sciences, a veterinarian from the Massachusetts

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[17] For the reference to "cow leech" see *Amer Vet Rev*, 1885, *9*. 50 The citation from Law is "Diseases of domestic animals," (1880), quoted in J F Smithcors, *The American Veterinary Profession Its Background and Development* (Ames, Iowa Iowa State University Press, 1963), p 432 Unfortunately, Smithcors is unable to provide the full citation for this and other documentation in his valuable book since his references were lost moving from Michigan to California. Smithcors suggests that the professional breach between physicians and veterinarians was aggravated by the veterinarians' preoccupation with horse diseases, a preoccupation that diminished with the development of the automobile, *ibid*, p 389 For veterinarians' charges that their knowledge of animal disease and its implications for human health was ignored, see also Stanley M Forsythe, *The Story of Bovine Tuberculosis* (London. Old Tree Books, 1949), J A. Myers and J H Steele, *Bovine Tuberculosis Control in Man and Animals* (St. Louis Warren H Green, 1969) *The American Veterinary Review* documents institutional and scientific aspects of veterinary professionalization after 1877 At the time relations between comparative pathology and veterinary medicine were close and Edward Charles Spitzka, who was later better known as a neurologist, was professor of anatomy and embryology at Columbia Veterinary College and the first editor of *Archives of Comparative Medicine and Surgery*

[18] "The grandeur of the veterinary profession," *Amer Vet Rev*, 1898, *22* 303–6 For the more modest claims of an earlier date, see Frederick A. Lyons, "The true position of veterinary science, and the requirements necessary to its proper study," *ibid*, 1879, *3* 301–15

Department of Agriculture, at the Tuberculosis Congress in 1908, concluded an account of the history and prospects for eradication of cattle disease with an assertion. He said that while physicians were still groping in the dark, "Veterinarians can point with pride to the fact that they are the pioneers who have blazed the path through the wilderness, built the roads, and constructed the bridges over which the main army is now so eagerly rushing into the field in which 'medicine is coming to her kingdom.' "[19] Austin Peters's experience as veterinarian to the Massachusetts Society for the Promotion of Agriculture in his youth, and later as Chief of the Commonwealth's Cattle Bureau, inevitably shaped his instructive paper and helped to remove the difficulties that had obstructed progress along the way. Peters began his history of Massachusetts's concern for bovine tuberculosis with a disgruntled former employee's accusation that there was disease in the prize herd kept by the Massachusetts Agricultural College. Peters reported that in 1880 the head of the College Veterinary Department had assured local farmers they could purchase and breed from an infected prize herd because "the disease is only consumption, and may attack ... cattle in any part of the country," and furthermore, "the milk is healthy until the animal's constitution is utterly reduced."[20] This opinion continued to be accepted by dairymen even after it was clear that the tubercle bacillus was the agent of bovine disease. France was the first national government to classify tuberculosis among cattle as a scourge spread by contagion, but the laws of 1887 and 1888 did not resolve the dilemmas of how to manage infected animals or market the dairy produce and meat that might be affected. The Harvard bacteriologist, Harold C. Ernst, at the 1888 International Congress in Paris, called for scientists to establish and verify the facts about bovine tuberculosis "by the collection of clinical and experimental evidence" so that the public authorities could "reconcile the money interests of man with his own welfare." When his talk was published two years later, Ernst observed a recent "very marked" change in public opinion about the infectious nature of tuberculosis. Ernst thought that it should now be possible to act on the basis of what he claimed had long been a consensus among physicians, that bovine tuberculosis was contagious for humans.[21]

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[19] "History of the Agitation Against Bovine Tuberculosis in Massachusetts, Resulting Legislation, and Lessons to be Derived from the Attempts of the State Toward its Eradication and Control," *Trans. Sixth Int Cong Tuber*, 1908, *4* 901

[20] This is based on reports published in the *Springfield Republican* on 30 January and 6 February 1880 Professor Levi Stockbridge, who faced the charges of Dr Noah Cressy, served on the Massachusetts Cattle Commission from 1868 to 1894, and presumably changed his mind about the dangers of bovine tuberculosis Cressy, for his part, was vindicated when called to address the first Massachusetts Convention of Cattle Inspectors in 1893 Unfortunately, he spoke so fast that the reporter was unable to record his words, *Annual Report of the Board of Cattle Commissioners of Massachusetts* (Boston, 1895), p 133 See also James B Paige, "History of Tuberculosis in the College Herd," *Hatch Experiment Station of Massachusetts Agricultural College, Bulletin No 27* (1895)

[21] Ernst, "How far may a cow be tuberculous?" Massachusetts law in 1888 required the slaughter of all animals infected with tuberculosis or glanders there was no indemnity unless the destroyed animal was found to be totally free of disease on post-mortem The law was amended in 1894 to provide additional

If this had been the accepted opinion among Ernst's mentors and professional colleagues in the twenty-five years since Villemin's mid-century inoculation studies, the knowledge was not well reflected in the medical literature or in physicians' influence on public affairs. On the contrary, an 1890 survey of 18,000 physicians and veterinarians that Ernst conducted for the Massachusetts Society for the Promotion of Agriculture as part of an investigation of "the infectiousness of milk," showed that Massachusetts doctors denied the danger of milk as a source of tuberculosis in their patients. Among 1013 physicians answering the inquiry, "Have you ever seen a case of Tuberculosis which it seemed possible to you to trace to a milk supply as a cause?" 893 answered "no," eleven reported that they had encountered cases of tuberculosis definitely traced to cows' milk, and sixteen were suspicious that this connection might exist. Four years later Ernst collected evidence from seventeen states showing that there was a high prevalence of tuberculosis among cattle. Ernst concluded that, though transmission of tuberculosis to humans through infected milk was infrequent, it was possible, even when direct physical examination did not reveal signs of the disease in cows. Ernst believed that "action" was needed to prevent the spread of disease among cattle "as well as to protect consumers from the use of tuberculous beef and dairy products," although he could not specify or advocate the preferred action.[22] In retrospect, the lack of symmetry between Ernst's earlier claim that physicians were generally aware of the dangers of bovine tuberculosis and their failure to confirm this attitude, and the diffidence with which he endorsed measures to eradicate the disease in cattle might be explained as statesmanlike restraint. But the conflict about bovine tuberculosis continued to rage over the next decades in the United States, and Ernst's dilemma had complicated origins that continued to shape public opinion and professional judgment.

In the midst of debate over Koch's claims for the safety and efficacy of tuberculin therapy, Leonard Pearson, a Pennsylvania veterinarian, measured the elevated temperature that followed inoculation of cattle with this glycerinated extract of the tubercle bacillus. The degree of reaction provided evidence for Pearson's diagnosis of tuberculosis in fifty-one animals out of a purebred herd of seventy-nine. It is not known whether the Massachusetts Veterinary Association was chilled by the news that cattle valued at $10,000 were slaughtered after Pearson's discovery, but Ernst was a participant in the 1894 meeting of the MVA and reassured participants of the safety of tuberculin and its value as an aid in

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compensation. At international meetings the French, particularly S. Arloing of Lyons, were among the first to emphasize the danger of bovine tuberculosis for human health, but in 1888 the French described the danger as slight although they believed that the transmission of tuberculosis was possible.

[22] Harold C. Ernst, *Infectiousness of Milk: Results of Investigations made for the Trustees of the Massachusetts Society for Promoting Agriculture* (Boston, 1895), pp. 14, 38, 112, 114. The fifty-four veterinarians responding to Ernst were differently divided, but comparison with the physicians is not informative without more knowledge of both samples. Thirty-one veterinarians said they knew of no case where tuberculosis in humans was traced to milk, fourteen answered "yes," and nine knew of cases where the connection was suspected.

ridding dairy herds of tuberculosis. Though uncertainty dominated the Boston meeting and continued to be widespread, in this same year the Department of Agriculture in Washington made tuberculin available to cattlemen and farmers through the Bureau of Animal Industry.[23]

In Pennsylvania, a newly established State Livestock Sanitary Board headed by Leonard Pearson, and in Massachusetts, the reorganized Cattle Commission led by two faculty members from the Harvard Veterinary School, offered enticements to encourage farmers to use tuberculin to locate latent disease. Reassurance that tuberculin was harmless in itself was frequently paired with encouragement about the advantages of surveillance. Pearson promoted voluntary testing of entire herds in Pennsylvania with the enticement that self-restraint would eventually be rewarded. In Massachusetts this appeal to virtue was apparently less convincing and it was difficult to sustain an argument about the long-term benefits of slaughtering tuberculin reactors based on profits to be garnered once the disease had been eradicated. Although in later years Massachusetts's experience was often cited as exemplary, a good deal of persuasion was necessary to convince the owners of cattle in the Bay State that scientific testing was a more reliable indicator of disease than physical examination.

In 1895, at a time of profound economic distress, James B. Paige, a professor of veterinary medicine at the Massachusetts Agricultural College counseled the use of tuberculin for accurate diagnosis. He simultaneously wrote in the Bulletin distributed by the Hatch Experiment Station that "Tuberculosis in cattle is an incurable disease, and treatment should not be attempted." Advising the owners of diseased cattle to slaughter their animals, then bury them or have the carcasses rendered, he argued that "every person in the state has an interest and has a right to demand protection at the public expense from this deadly foe." Although Paige concluded his article with a notice to farmers of his willingness to examine pathological specimens or parasites free of charge, he avoided the issue of compensation for slaughtered cattle.[24] A good deal of effort was expended to secure the cooperation of farmers after tuberculin was made available and, typically, the Western

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[23] L. A. Klein, "Pioneer work in tuberculosis control," (1921) quoted in Smithcors, *American Veterinary Profession*, p 469 At the Massachusetts meeting Ernst reassured farmers and dairymen that injecting tuberculin would not infect their cattle with tuberculosis He equivocated about the value of diagnosis of disease that was not manifest in visible lesions, contesting Hermann Biggs's position that a healed cicatrix was evidence of earlier disease Ernst used this same occasion to advocate sunshine and fresh air as "the very best germicide," and suggested that city dairymen opposed state action because they feared being forced to clean up their stables, " and they begin to feel they will be obliged to put out more money upon their cattle, then they will go out of the business rather than run that risk." See "Reports of Societies," *Boston Med. Surg J*, 1894, *131* 533–34 Ernst appears to have simultaneously held contradictory positions if we compare his talk to the veterinarians with the report he prepared for the Massachusetts Society for the Promotion of Agriculture published the next year

[24] "On the use of tuberculin," *Hatch Experiment Station of the Massachusetts Agricultural College, Bulletin No 41*, (1896) *Annual Report of the Board of Cattle Commissioners of Massachusetts* (Boston, 1895), pp 16, 19–27, 37–52 James B Paige, "Tuberculosis, with special reference to the disease as seen in cattle and other domesticated animals," *Faculty Publications*, Massachusetts Agricultural College, (1895), Also see n 21

Worcester Agricultural Society meeting in the spring of 1895 attracted between 150 and 200 doubting Thomases. After the meeting was informed that the Commission was "doing this business in a scientific way," meaning that tuberculin testing was supported as an improvement over other tests, the sticky question of whether the state would actually pay "fair value" for slaughtered animals was raised.[25] Once Worcester County farmers were so assured, they proceeded to clean up their herds in an orderly way. The Massachusetts legislature cooperatively appropriated $300,000 in 1896 and another $250,000 in 1897 for statewide programs. In the spring of 1897 Middlesex County farmers found the opportunity to do well while doing good impossible to resist. As reported later, after the herds were tested by veterinarians at the owners' expense, "the veterinarians reported reacting animals to the cattle commissioners, who had the animals appraised and killed, leading to a raid on the appropriation" over which there was no control. Understandably, this led to the appointment of a state oversight committee which included reputable medical and veterinary scientists who were assigned the crucial task of establishing criteria for indemnification.[26]

An aggressive public policy aiming at the eradication of bovine tuberculosis was not easy to implement, but there was lots of encouragement from Washington where the Bureau of Animal Industry produced and distributed free tuberculin in ever larger amounts. In 1898, DeSchweinitz, director of the Bureau's Biologics Laboratory, announced that 9,000 units of tuberculin were distributed monthly. Despite increased use of tuberculin, American veterinarians, meat and dairy inspectors, and even public health officials remained dubious about adopting such programs as the more flexible, yet rigorous sanctions sponsored by the Danish government to clean up that nation's dairy industry. Bernhard Bang's distinction between tuberculin reactors that could be quarantined to protect the rest of the herd, while their milk and meat were sold under specific conditions, and those animals so badly diseased that slaughter was mandatory, required a significant public investment.[27]

As estimates of the extent of disease among dairy and meat cattle escalated, evidence of enormous variability in the prevalence of bovine tuberculosis mediated responses to specific programs, whether lenient or aggressive. Canada reported little bovine tuberculosis, and Canada's most prominent public health spokesman was confident, in 1899, that the disease could be eradicated at a cost of about $250,000. He agreed with European authorities that on the Continent, from 5 percent to 50 percent of dairy cows were affected, while beef cattle were better off both because they were usually slaughtered at an earlier age and because in the pasture they were less exposed to infection.[28] In the United States, where the beef and dairy industries were often geographically and economically separated, careful assessment of the extent of local disease became a serious consideration, especially as it appeared that prevalence might be highest among dairy cattle in the eastern states. In states where milk and butter were the main sources of danger to human health from bovine tuberculosis, it was particularly important to determine under what conditions exactly the dairy cow became valueless to its owner. Clinical studies showed that exposure to tuberculosis did not always produce disease in humans, whether the bacilli were transmitted in food or in air droplets. When laboratory tests showed that tubercle bacilli were found in the milk from cows with no gross physical symptoms, some people observed that this underscored the significance of tuberculin testing, but others drew attention to the ambiguities of the distinction between cleanliness and freedom from disease.[29]

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[25] Massachusetts General Court, Joint Committee of the Agriculture Committee and the Public Health Committee, manuscript record of public hearing held February 13–17, 1895, Massachusetts State Archives

[26] Peters, *Trans Sixth Int Cong Tuber*, 1908, *4* 895–96 Peters believed that "The farmers who had the testing done in most cases had no interest in an attempt to diminish bovine tuberculosis in the State, but simply did it as a matter of speculation, with the idea of selling a lot of old milked-out cows to the Commonwealth for more than they were worth." When a larger number of reactors than anticipated were found in these herds, these farmers were almost wiped out, according to Peters

[27] DeSchweinitz's paper was delivered at the Congrès pour l'étude de la tuberculose chez l'homme et chez les animaux (Paris, 1898) and published in its *Proceedings*, pp. 599–602 A full description of Bang's work is in *Trans Sixth Int. Cong Tuber*, 1908, *4* 840–68.

Clean milk carried a freight of meanings, and campaigns to produce clean milk and protect its purity had rallied public health and medical support long before the issue of bovine tuberculosis became prominent.[30] In the first years of the twentieth century, urban Americans continued, for good reason, to regard dirty milk as both symbol and evidence of material and moral corruption. Scientific investigations distinguished between the germs of disease and dirt, attempting to educate public opinion without forfeiting the advantages of popular indignation. Alfred F. Hess entered the debate over bovine and human tuberculosis at the 1908 International Congress with a report based on an analysis of New York City's milk supply. With scrupulous honesty, Hess explained that his finding of tubercle bacilli in 16 percent of the milk that was sold across the counter might be unduly elevated because his sample was drawn from a mixture of bulk and bottled milk. He admitted that milk dipped from bulk supplies might well become contaminated in the store, and that there was no way to determine from how many different sources the milk he tested had been collected Still, Hess felt certain that his studies demonstrated a threatening situation, and reasonably concluded that no matter what the source, "Even the staunchest supporter of Koch would not care to have his children drink milk from a cow he knew was excreting bacteria."[31]

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[28] Adami, "Significance of bovine tuberculosis," p 1278 and Schroeder, "Some facts about tuberculosis," p 218, Bureau of Animal Industry (USDA), *Special Report on Diseases of Cattle and on Cattle Feeding* (Washington, D C G P O , 1892), pp. 399–402, 420–21

[29] The investigations that led to publication of Ernst, *Infectiousness of Milk*, reflected some of the conceptual and practical dilemmas associated with finding tubercle bacilli in the absence of demonstrated transmission of disease from cattle to humans through milk. Only fragments of Ernst's correspondence have survived, and although there are a few letters on this investigation at the Francis A. Countway Library of Medicine, Holmes Hall, Harvard University, they include nothing of real interest.

[30] Well-known nineteenth-century investigations are Robert M. Hartley, *An Historical, Scientific, and Practical Essay on Milk as an Article of Human Sustenance with a Consideration of the Effects Consequent Upon the Unnatural Methods of Producing It for the Supply of Large Cities* (New York, 1842) and William T Sedgwick, "On the protection of milk supplies from pollution," *J Mass Assoc. Bds. Hlth*, 1898, *8* 4–39

Increased milk consumption in every industrializing nation, and especially in the United States, resulted in larger dairy profits but very little in the way of legislation regulating the production and distribution of dairy supplies. Much of the material written about the dangers of infected milk in the early twentieth century exemplified a strange twist in thinking that occurred when the emphasis on detecting specific agents of infection replaced a less precise indictment of dirt. By 1903, seventy-five cities with populations of 50,000 or more supervised the quality of milk sold to consumers and slightly less than half of these depended on bacteria counts to measure purity. Despite wide variation in the maximum number of bacteria permitted in milk from one city to another, the time seemed ripe to establish objective standards of cleanliness based on laboratory criteria. Although frequently differences in regulatory procedures were attributed to political manipulation, as with interpretation of the tuberculin reaction, it seemed only a matter of time before regular and adequate appropriations would guarantee the professional cadre needed to assure "good honest milk" now that technical obstacles to detection of bacterial contamination were overcome. Announcing that the confusion between contamination and adulteration that had befuddled earlier generations had been eliminated, one investigator wrote, "There is a growing realization of the fact that while watering and skimming, or in any way reducing the food value of milk, is a fraud or theft, still these practices do not menace health; whereas, cows suffering from diseases communicable to man through milk, and milk infected with the specific micro-organisms of disease, or milk wherein bacteria have multiplied enormously, must be considered as definite health problems." This perspective led city and state milk inspectors to emphasize freedom from disease at the source of supply and to look with favor on the large producer who could "control his business" more easily than the family farmer. In all likelihood this confidence was warranted, but the scientific distinction between the germs of animal disease and the seeds of human dishonesty could lead to a potentially lethal overestimation of regulation. Milk was often the vector in epidemics of typhoid and diphtheria as a result of negligence along the course of delivery, and human carriers were an important reservoir of typhoid and diphtheria; these were the diseases responsible for the early childhood mortality that commanded public attention far more imperiously than tuberculosis.[32]

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[31] *Trans Sixth Int Cong Tuber*, 1908, *4*· 528–29 Hess cites Anderson, *Hyg Lab Bull No 41*, who reported 6 72 percent of milk positive for tubercle bacilli, and Rabinowitsch and Kempner, "Beitrag zur Frage der Infectiositat der Milch tuberculoser Kuhe, sowie uber den Nutzen der Tuberculinimpfung," *Zeitschrift fur Hygiene und Infectionskrankheiten*, 1899, *31* 137–52, who reported that 28 percent of Berlin's milk was similarly contaminated

The most important reason for the thrust of action against milk-borne disease being in the barnyard was that the earliest initiative against bovine tuberculosis came from veterinarians. As city and state boards of health became better organized and more visible in the 1880s, veterinarians pressed their claims to official recognition whenever animal products were sold. And ambitious veterinarians also saw this as an opportunity to put their own house in order, so at the same time as they urged boards of health to hire only "qualified" veterinarians as inspectors, the United States Veterinary Medical Association also voted to limit its membership to graduates from approved "professional schools." Veterinarians were never satisfied, however, that their scientific skills and knowledge were recognized by sanitarians, and complained that state and local boards of health treated veterinarians as technical assistants, stipulating "competence" rather than special qualifications as criteria of employment. As supervision of dairy products fell largely to state and local governments, and regulation increasingly required working alliances among politically important community leaders, veterinarians were left out in the cold. Rising expectations were reflected in a 1901 issue of the *American Veterinary Review* in which eight articles on bovine tuberculosis accompanied an article advising that "The outlook for the veterinary profession never was so bright as at the present time." The very next year the same journal anxiously questioned "Are we getting too numerous?"[33]

As a wider public became alarmed about the dangers of cattle disease for human health, it became advantageous to bring together several different arguments to reinforce each other. Veterinarians reasonably saw that public interest could provide incentives for dairymen both through support of appropriations needed to fund indemnity payments and by educating consumers to discriminate among different dairies. Initially there was marked cooperation between veterinarians and health officials who also sought public understanding and support for more effective inspection of milk. It was logical for public health departments to endorse tuberculin testing as one measure to improve the milk supply, even though tuberculosis was not the most frequent source of milk-borne disease and tuberculin reactive cows did not necessarily shed bacilli in their milk.[34] Tuberculin testing and scientific supervision of dairy herds also received a boost from physicians who opposed pasteurization. "Artificial feeding" threatened infant health, so that social workers and health inspectors urged tenement mothers to breast-feed their babies through the first summer as the best protection against the diarrheal diseases that were often fatal. Pediatricians consulted by more affluent parents stressed the nutritional loss incurred with pasteurization, sometimes urging specially "certified" raw cow's milk. Other critics pointed out that milk of poor quality could pass muster when it came to a bacteria count after pasteurization, without being up to chemical standards for butterfat and cream. And although the Bureau of Animal Industry would urge pasteurization because "commercial milk, or the kind sold in our cities, wholly free of contamination . . . is a comparatively rare article," this also was viewed as an unwholesome concession.[35] At first the rhetoric of purity made room for just about everybody concerned with milk-borne disease and veterinarians' endorsement was welcomed by promoters of certified milk from tuberculin tested herds.

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[32] Edwin Henry Shorer, "A summary of milk regulations in the United States," *J Amer Pub Hlth Assoc*, 1911, *11* 847–56 Macyzk P Ravenel claimed that "in America more raw milk is consumed than in any other country of the world," *Proc Fifteenth Int Cong Hyg Demog*, 1912, *4* 274 For an interesting analysis of English and Welsh data see M W Beaver, "Population, infant mortality and milk," *Pop Stud*, 1973, *27* 243–54.

[33] Smithcors, *American Veterinary Profession*, pp 335–36 Smithcors chronicles the hesitant response of boards of health to veterinarians, pp 404–15 In Connecticut, the *New England Homestead* (1882) commented: "There would be about as much sense in asking the Legislature to appoint a State physician, giving to such a person exclusive medical privileges over the mass of practicing physicians" E L Quitman, "The veterinary profession and its future," *Amer Vet Rev*, 1901, *25* 731 Also, editorial, *ibid*, 1902, *26* 1096

In the long run, however, when physicians became thoroughly involved in the campaign for safe milk, veterinarians were no longer welcome, and sometimes even accused of supporting farmers' interests in opposition to hygienic progress.[36] Physicians considered milk-borne disease as much in their domain of knowledge as any other pathology, and every authority on animal disease whose diagnosis impinged on human disease was ultimately subject to the physicians' stamp of approval. Tuberculosis morbidity from bovine bacilli remained a medical concern, and Park's study assigning milk responsibility for 3 percent of the tuberculosis reported in New York City was used to show that this represented twenty-two out of every eighty-four cases diagnosed in infants. In reporting these statistics once again at the 1912 International Congress on Hygiene and Demography, the bacteriologist Harry L. Russell, Dean of the College of Agriculture at the University of Wisconsin, argued that after ten years of tuberculin testing, the United States was a long way from solving the problem. Furthermore, he thought that it was foolhardy to take steps against tuberculosis and leave milk-borne typhoid alone; Russell concluded that state-mandated pasteurization was the only sound policy. At the same meeting Edwin O. Jordan reported that the New York Milk Committee, once opposed to pasteurization, now favored such treatment of all milk.[37] The swing to support of mandatory pasteurization reflected widespread agreement that supervision of the purity of food—determining what was safe to eat—rested with the physician, even when the source of danger was presumed to originate in animal disease.

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[34] Studies reported in the 1890s were replicated frequently in the next decade, and with general agreement that milk would not contain tubercle bacilli from the cow unless the udder was affected Nonetheless, the tuberculin test became the accepted test of communicable disease In Borden Condensed Milk Company *vs.* the Board of Health of the Town of Montclair, New Jersey (1911), the court upheld the legality of this test as a barrier to sale of milk in the absence of other symptoms, citing the acceptance of tuberculin reaction as the standard measure in twenty-two states; see Rosenau "Milk question," pp 109–12

[35] Chicago in 1908 was the first large city to require pasteurization of milk that was not tuberculin tested, but here as elsewhere various exceptions and variable standards of enforcement prevailed through the 1930s New York and Boston passed legislation requiring pasteurization in 1910, and it was reported that in Boston one-half of the milk sold commercially was pasteurized even before the law was enacted. See U S Public Health and Marine Hospital Service, Hygienic Laboratory, *Milk and its Relation to Public Health*, Bulletin No. 56 (Washington, D C, 1909), and Edwin O Jordan, "The case for pasteurization," *Trans Fifteenth Int Cong Hyg Demog*, 1912, p. 632 Schroeder, "Some facts on tuberculosis," p 219

[36] E. R. Larned, "Unclean milk, bovine tuberculosis and the tuberculin test—their relation to the public health," *Boston Med Surg J*, 1903, *149* 563–67, 594–97, runs through the case for tuberculin testing as the best assurance of safety, and maintains that standards were modified or went unenforced in order to protect farmers

As the seemingly close connection between controlling disease in beef and dairy cattle and in man began to come apart, there were new variations of the old dilemmas faced by the Massachusetts Cattle Commissioners in 1897 when they advocated indemnification for tuberculin reactors as a simple solution to a complicated problem. Thirty years later, the editor of the *Twentieth Century Farmer*, a journal published in Omaha, Nebraska, took to task the city of Milwaukee because, though it required milk sold in the city to be tuberculin tested, the City Council refused to pass part of the additional cost on to consumers. The editor claimed that rejection of a price increase amounting to only one-third of a cent per quart made it impossible to enforce the regulation[38] In big cities competition was among the companies that supplied their customers with pasteurized milk, and the price of a bottle was a critical factor. But from the customers' perspective the tuberculin-tested herd was a solution to someone else's problem.

New York City physicians concerned with public health believed that the milk supply continued to menace health even after pasteurization became mandatory. Their target of further control was the sale of bulk milk after it had been discontinued in other cities. Forty percent of all New York City milk was dipped from "loose" supplies or sold in bulk to hospitals and restaurants. Public health authorities implicated small milk producers and dealers in this trade that they claimed was unjustly defended as a service to the poor. Although the Visiting Nurse Association and social agencies active in the tenement district denied that the poor fed this milk to infants, this was the ostensible rationalization for maintaining supplies of the lower priced milk. On the other hand, since there had been no epidemic traced to the sale of "loose" milk for some years and bovine tuberculosis was no longer a significant factor in milk-borne disease, the Health Department was, in 1927, reluctant to be directly involved in a proposed investigation of small wholesalers. After securing the backing of large producers and distributors, Dr. John North, director of a private laboratory, proposed that the New York Tuberculosis and Health Association should assume responsibility for a survey of milk distribution that would surely end the sale of "loose" milk. North was a vigorous supporter of the New York City Health Department who identified the continued sale of bulk milk as unwelcome evidence that powerful "political influence" was able to evade health reformers. When, in the course of this campaign, William H. Park was questioned about impediments to the assurance of safe milk that overwhelmed scientific techniques he asked for more inspectors so that they "might keep the ignorant and dishonest farmers and dealers on their good behavior."

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[37] Harry L. Russell, "The functions of the state in milk control," *Trans Fifteenth Int Cong Hyg Demog*, 1912, p 607 Jordan, "Case for pasteurization," leads off his article with a quotation from the Illinois State Board of Health calling pasteurization "an unreliable remedy for an uncertain danger." Also see Manfred J Waserman, "Henry L. Coit and the certified milk movement in the development of modern pediatrics," *Bull Hist Med*, 1972, *46* 371–74 for a discussion of the Medical Milk Commissions in their support of certified milk in preference to pasteurization

[38] E Z. Russell's introduction to a collection of papers published under the title *Bovine Tuberculosis* (Chicago American Veterinary Publishing, 1917), pp 19–20 Russell focused on the economic obstacles to eradication as did John A. Kiernan, Chief of the Tuberculosis Eradication Division of the Bureau of Animal Industry Russell's audience was largely cattle men and he supported the BAI schedule for compensation (100 percent payment of appraised value when no tuberculosis was found on autopsy, 80 percent when the carcass could be sold for meat, and 40 percent when generalized disease prevented sale for food)

In the cast of villains defiling milk, hidden disease was replaced by hidden motives. As each apparent obstacle to guaranteeing healthful milk was overcome, another emerged. The distribution of animal produce was easily tainted by the peculiar moral odor of the middleman. While the New York Health Department wrestled with the small producer and "loose" milk, Hugh Cumming, Surgeon General of the United States Public Health Service, reminded the Commissioner of Health in Massachusetts that consumers must be represented in formulating milk regulations and the public should be reassured that government was not indirectly protecting dairy interests "as a means of restraining free competition and thus increasing the local price of milk." Neither the State Department of Agriculture, nor any veterinary group were on Cumming's membership list for the Milk Regulation Board, but he stressed the point that "because the dairy inspection work is essentially public health work, the executive department of the Board should be the State Department of Health." By the 1920s, even in Massachusetts, where historically veterinarians and physicians had joined hands to protect cattle and humans from disease, medical men were now the supervening authority.[39]

As the threat of animal disease to human health assumed different proportions, the danger was inevitably portrayed in a different light. Although there had never been substantial evidence that tuberculosis could be transmitted after meat was cooked, the image of the diseased meat had contributed a share of anxiety to early efforts to keep the carcasses of diseased cattle off the market. But when public indignation over conditions in the stockyards brought Theodore Roosevelt into action and warranted a federal investigation of the meat trusts in 1906, scientists and veterinarians who had been leading efforts to rid the range and barnyard of tuberculous cattle were pushed aside. In an atmosphere in which the sale of infected meat and the protection of special interests were closely connected by the President, the Bureau of Animal Industry was rebuked for its inadequacies, and its investigation of stockyard conditions superseded by a special commission to serve as the visible response to popular indignation aroused by Upton Sinclair's novel *The Jungle.*[40]

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[39] The New York Milk Committee was originally organized by the New York Association for Improving the Condition of the Poor in 1906 Incorporated separately in 1910, it included prominent physicians, social activists, and philanthropists, and collaborated with the New York City Health Department, opposing state regulation because this would transfer authority from the Health Department to the Department of Agriculture This position reflected the belief that grading (chemical standards) could not be implemented until milk inspection was tightened to protect cleanliness and bacterial standards See J H Larson to E. H Lewinski-Corwin, 5 April 1918, Director's File, New York Academy of Medicine Archives In 1927, a Joint Milk Committee of the New York Tuberculosis and Health Association and the New York Academy of Medicine estimated that 3,000,000 bottled quarts of milk were sold daily in the city, and 2,465,000 quarts were sold as "loose" milk. See Charles E North to Lee K Frankel, 22 November 1926, for discussion of conditions in New York and comparisons with other cities, Committee on Public Health, "Milk 1925–1935" file, New York Academy of Medicine Archives For Cumming's advice to Massachusetts see H S. Cumming to George H. Bigelow, 21 January 1929, Record Group 90, Box No 37, Folder 0620-133, National Archives

In some respects tainted meat had always carried a heavier political burden than infected milk; commerce in meat and meat products attracted a more powerful constituency. The Bureau of Animal Industry had been involved in meat inspection since the 1890s, largely in order to protect and promote the sale of American meat and meat products abroad.[41] The danger from the sale of rotten meat at home was no less serious, but there had been little federal or state support for regulation of these sales. More to the point, elimination of meat from diseased animals, as distinguished from spoiled meat, involved cattle on the hoof, and the eradication of cattle disease would have shifted responsibility from the stockyard and packinghouse to the cattle owner. To complicate the problem further, much disease dangerous to cattle was not a threat to human health. When public opinion was agitated by the conviction that dangers to health had festered because of greed and conspiracy to defraud, it was unlikely that a program of compensation to the cattle owners could win much enthusiasm.

Under these circumstances the Bureau of Animal Industry's emphasis on the economic justification for eradicating tuberculosis among beef cattle underscores both the shift in strategy and the unexpectedly successful consequences of that strategy. Still working on the assumption that legislative support for eliminating animal disease in the meat industry depended on making the connection to human health as much as it did in the dairy industry, the Bureau, with its close association to veterinary medicine, assessed its uneasy relations with physicians. Warning that a substantial amount of meat on the market had not either received or passed inspection, and at the same time stoutly defending the welfare of cattle breeders, the Bureau launched a campaign of tuberculin testing, quarantine, and slaughter of diseased animals with indemnification. Though this program was always backed up with reminders of veterinarians' knowledge of and interest in human health, it seems unlikely that its fortunes depended on the threat of contagion from animals to humans.[42] Despite some evidence that reliance on tuberculin reaction led to wasteful and unnecessary slaughter, indemnification retained the Bureau of Animal Industry's support, and between 1917 and 1940 Federal funds established the incentives that enabled each state to meet the national standard represented by less than one half of one percent tuberculin reactors in every herd.[43] Ironically, Massachusetts did not benefit from the money that the United States Department of Agriculture made available to the states for tuberculin testing. After its early unfortunate experience with indemnification, the Commonwealth prohibited reliance on tuberculin, turning instead to physical examination by accredited veterinarians as the condition for compensating the owners of condemned animals.[44]

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[40] For an excellent discussion of the political context in which the packinghouse investigations took place see John Braeman, "The Square Deal in Action. A Case Study in the Growth of the 'National Police Power,'" in John Braeman, Robert H. Bremner, and Everett Walters, eds , *Change and Continuity in Twentieth-Century America* (Columbus, Ohio Ohio State University Press, 1964) See also Smithcors, *American Veterinary Profession*, pp 471–78

[41] Smithcors, *American Veterinary Profession*, pp 398–402, James H Cassedy, "Applied microscopy and American pork diplomacy Charles Wardell Stiles in Germany 1898–1899," *Isis*, 1971, *62* 5–20

Despite evidence that the threat to human health from bovine tuberculosis was largely moot from the start, one could say that the enduring controversy provided text and pretext for conquest of both the animal and the human malady. It is less certain why the argument heated up and evoked such animosity after differences of opinion about the cause and incidence of the disease in man and beast had disappeared. The rhetoric was, of course, a commonplace of American political culture; the picture of special interests fueled by expert advice from scientifically informed professionals ambitious for recognition made it tempting to imply, then and now, that there were no real issues, and that abandoning the bovine tubercle bacillus would have left the contestants without a platform[45] Participants such as Theobald Smith and Milton Rosenau were, however, persuaded that the controversy aroused by Koch's denial of significance to the bovine bacillus stimulated research, and George Kober expansively asserted that the debate had advanced science because "opposition fosters the spirit of inquiry."[46]

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[42] Russell, ed., *Bovine Tuberculosis,* reported that although the BAI had inspected 58,000,000 animals destined for the butcher in the fiscal year ending July 1915, another 40,000,000 went to the consumer without inspection The costs of this neglect were heavy, and Russell claimed they fell especially upon cattlemen since absence of inspection reduced the incentive to eradicate tuberculosis, even though inspection was not particularly directed against the disease In the 1920s, spokesmen for the BAI made concerted efforts to link public health and veterinary interests See quotations from James R. Mohler and John A. Kiernan in Smithcors, *American Veterinary Profession,* p. 470

[43] For caution lest tuberculin lead to slaughter "promiscuously" see D F Luckey, "The Intradermal Test," in Russell, ed., *Bovine Tuberculosis,* pp. 79–100, Richard W Hickman, "The eradication of cattle tuberculosis in the District of Columbia," in *United States Department of Agriculture Yearbook, 1910* (Washington, D C G.P.O., 1910), pp 231–42, Charles Wood, "Science and politics in the war on cattle diseases the Kansas experience, 1900–1940," *Agr Hist*, 1980, *54* 82–92

[44] *Massachusetts Senate Document, No 69* (1921), "Report of the commission appointed to investigate relative to the control of tuberculosis in bovine animals (1920)"

[45] No one spoke more candidly than Henry L Coit who wrote " 'Tuberculin tested milk' is a charmed phrase used by milk concerns and Boards of Health and the credulous and uninformed public is led into a false sense of security," in his article, "How to meet the fact and estimate the danger of bovine tuberculosis," *Proceedings of the Ninth Annual Conference of the American Association of Medical Milk Commissions,* 1915, p 183 See also Waserman, "Henry L. Coit," p 383

The inclination to dismiss the negative consequences of this debate is not surprising; the spectacle of scientists fighting in public was not edifying and their differences were not perceived as fundamental. The debate was, of course, structured by competing professional interests; as the comfort once afforded veterinarians and sanitarians in complementary strategies waned each followed similar adversarial tactics hoping to assure their reputations and status by association with physicians. But as I have suggested, the visibility and significance of these maneuvers should not overshadow the substance of debates about tuberculosis. Passions were aroused in part because of the hard experience entailed in the control of highly fatal animal and human disease. Even though successful elimination of bovine tuberculosis in cattle had little relevance for human health, the battle against all tuberculosis was seen, especially by public health authorities, as necessarily related.[47] Throughout the struggle with these dangerous diseases, the significance of shared susceptibility continued to operate at several levels and this had practical consequences. The link between human and animal pathology was first trimmed to a link of etiology. When the substance of this biological connection came into doubt, the relevance of animal to human disease was more questionable, leaving cattle and their caretakers at risk and apologetic. In the end veterinarians, with a little help from their friends, conquered the disease in cattle. It is doubtful that rivalry among medical professionals was a significant factor delaying action, or that the rivalry was exacerbated as a result of encounters in the field

There was, however, a sibling relationship that had its roots in history, and, like family relationships, had meaning for the conflicts that arose in the short lifespan of controversy over bovine tuberculosis. Bovine and human tuberculosis are both members of the family *Mycobacterium;* the dilemmas of control in both diseases were inseparable from both the biological and social ambiguities that remained long after the practices which effected containment and eradication were worked out. Perhaps the most interesting aspect of this controversy was that it took place at just the time when, no matter what the family connection, the relationship between animal and human tuberculosis was no longer important. Although it had once been logical and useful to think of animal and human attributes that led to shared susceptibility and infection, the time came when neither science nor public policy would support that perspective.

[46] Smith, Discussion of A. D Blackader's paper, "Discussion of the relation," p 680, Rosenau, "Milk question," p 99, Kober, "Transmission of bovine tuberculosis," p 16

[47] Kober, "Transmission of bovine tuberculosis," pp 18–19 Kober sums up the state of knowledge in 1903 " the pathologist has no occasion to reverse his opinion as to the identity of human and bovine tuberculosis, and the sanitarian has no reason to assume that the human subject is immune against infection with the bovine bacilli or is so slightly susceptible as to cause him to relax his efforts in preventive measures "

"TYPHUS" FEVER IN EIGHTEENTH-CENTURY HOSPITALS: NEW APPROACHES TO MEDICAL TREATMENT*

Guenter B. Risse

> Fevers, it was argued, had undergone a radical change since the time of Sydenham in correspondence with many changes in diet, beverages, and creature comforts   Is change of type a reality or a fiction?[1]

This question, raised by Charles Creighton in his *History of Epidemics in Britain,* was based on a number of eighteenth-century writings describing an apparently new species of fever. Such an addition to the family of human diseases derived from extensive clinical observations made during epidemics that affected various parts of Britain in 1727–29 and 1740–42. Indeed, prominent physicians such as William Hillary, John Huxham, and John Barker, all recorded the appearance of slowly developing fevers that failed to display the traditional inflammatory symptoms.[2] These so-called *nervous* fevers had evidently occurred in the wake of harvest failures and subsequent famines, afflicting primarily the poor sectors of the population and striking especially during the winter season. Similar sorts of fevers were detected in workhouses and prisons.

By mid-century, the famous military reformer John Pringle had described a similar disease called "typhus" breaking out within crowded barracks, transport ships, and army hospitals. By the time John Millar, a prominent London practitioner associated with the Westminster Infirmary, published his conclusions in 1770, many physicians believed that a significant shift in fever type had indeed occurred in Great Britain.[3] In the spirit of Sydenham's concept

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* Expanded version of a paper delivered at the symposium "History of Disease" in honor of Lloyd G Stevenson, Institute of the History of Medicine, The Johns Hopkins University, 3 June 1983

[1] Charles Creighton, *A History of Epidemics in Britain,* 2 vols (Cambridge Cambridge University Press, 1891–94), 2· 2–3

[2] For details, see Dale C Smith, "Medical Science, Medical Practice, and the Emerging Concept of Typhus in Mid-Eighteenth-Century Britain," in William F Bynum and Vivian Nutton, eds, *Theories of Fever from Antiquity to the Enlightenment,* Supplement to *Medical History,* no 1 (Bucks, England Science History Publications, 1981), pp 121–34

[3] John Pringle, *Observations on the Nature and Cure of Hospital and Jayl-fevers* (London. A. Millar and D. Wilson, 1750), followed by his more substantial *Observations on the Diseases of the Army* (London A. Millar and D Wilson, 1752) See also John Millar, *Observations on the Prevailing Diseases in Great Britain* (London T Cadell and T Noteman, 1770), p 58

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that environmental conditions were responsible for epidemics, Creighton assumed that the country had clearly acquired a "putrid constitution" or a condition that favored the appearance of so-called nervous or putrid fevers.[4] However, practitioners in other European countries seemingly faced similar epidemiological changes and reached identical conclusions.[5]

As soon as these fevers were observed, physicians amended their disease classifications to include the new varieties. By the 1730s Huxham's two basic categories of continuous fevers were the "inflammatory" and the "low nervous," a distinction that henceforth was to have important therapeutical implications. In inflammatory fevers, an anti-phlogistic or anti-inflammatory regimen of traditional bloodletting and purging was still indicated to stop the acute symptoms reflecting excessive bodily congestion. In slow nervous fevers, on the other hand, the approach needed to be much more conservative, since most patients, to the surprise of their physicians, tolerated bleeding and purging poorly.[6]

In Edinburgh during the later eighteenth century, William Cullen retained such earlier nosological distinctions since, in his words, they were "taken from the difference of symptoms and from the nature of the disease."[7] Like other taxonomists of his time, he claimed in 1769 to have divided fevers on clinical grounds "according as they show either an inflammatory irritation or weaker reaction."[8] True inflammatory fevers were now called *synocha*, while the slow nervous fever was officially renamed *typhus* (in Greek, smoke or mist) to emphasize one of its most prominent symptoms: mental impairment in the form of delirium or stupor. Moreover, within the typhus category, Cullen discerned two basic forms: the *typhus petechialis* in which the sick person displayed a skin rash with petechiae or hemorrhagic spots over the chest and abdomen, and the *typhus icteroides*, in which the patient suffered from a low fever accompanied by jaundice. The petechial typhus, in turn, could be clinically mild—the usual slow nervous fever or *typhus mitior*—or severe and malignant with the appearance of gangrene—*typhus gravior*—usually prevailing in military camps, jails, and hospitals.[9] The latter had many unmistakable characteristics of the disease that physicians today consider to be louse-borne typhus or relapsing fever, often in association with typhoid fever.

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[4] Charles Creighton, "The Putrid Constitution of Fevers in the Middle Third of the Eighteenth Century," in Creighton, *History of Epidemics*, 2 120–28

[5] See, for example, Christian G Selle, *Medicina Clinica oder Handbuch der medicinischen Praxis*, 4th ed. (Berlin and Hamburg, 1788), pp 25–43

[6] John Huxham, *An Essay on Fevers and Their Various Kinds* . (London· S Austen, 1750), see especially p 5 and p 81.

[7] William Cullen, *Nosology, or, a Systematic Arrangement of Diseases, by Classes, Orders, Genera, and Species*, trans. from Latin (Edinburgh. W Creech, 1800), p 37 The original edition entitled *Synopsis nosologiae methodicae* was published in 1769

[8] *Ibid.*, p. 37

[9] *Ibid.*, pp 39–42

Unlike their traditional inflammatory counterparts, typhus fevers began insidiously with malaise, severe headaches, loss of appetite, and little heat as judged by touching the skin. Patients experienced increased prostration, a slow, weak pulse, dry cough, and the appearance of "nervous" symptoms including restlessness, pains, drowsiness, muscular tremors, and eventually high fever and delirium. Instead of reaching an acme and then subsiding within a few days, the nervous fevers lingered on, sapping the strength of the victim and prompting the appearance of a petechial rash on the chest and abdomen. After a week to ten days, the fever had a tendency to remit—thus the label "remitting fever"—recurring with new bouts of fever and delirium followed by gangrenous sores on toes, fingers, and points of the skin subjected to pressure. This complication was usually interpreted as a transformation of the nervous fever into a "putrid" one because of a "dissolution" of bodily fluids and solids The initial criteria for putrefaction were a fetid breath followed by a cadaverous stench that emanated from the patient's body because of infected bedsores. Another symptom interpreted as a sign of decomposition was episodes of diarrhea with bloody or greenish stools. At this point, death mercifully released many of the near comatose patients from their sufferings.

Although Cullen's nosological distinctions, first published in 1769, remained somewhat tentative, they nevertheless shaped clinical experience, at least at the Royal Infirmary of Edinburgh, the teaching hospital linked with the town's medical school. "No definition can be formed that will not be liable to cavil from those who are determined to find fault," declared James Gregory, one of Cullen's colleagues at the hospital.[10] Like Cullen, Gregory believed in the heuristic value of disease classifications, terming the distinctions among fevers "sufficient for purposes of practical nosology."[11] Cullen agreed, but continued to be concerned that "nothing shows so much the deficiency of observation as that this matter (distinctions among fevers) is not yet settled upon a tolerable foundation."[12]

Together with efforts to distinguish "typhus fever" from other illnesses, eighteenth-century practitioners speculated about the causes of such a dangerous malady. Most authors blamed a specific contagion generated in crowded, ill-ventilated, and dirty environments frequented by poor and debilitated individuals who were wasted by fasting, and hard labor.[13] Establishing such an etiology for typhus revealed a new level of professional awareness about health conditions among the populace. For perhaps the first time in history, physicians were coming into contact with substantial numbers of sick people belonging to the lower orders of society. Fueled by powerful social and political forces under the banner of Enlightenment ideology, eighteenth-century medicine was dramatically expanding the scope of its activities. Greater emphasis on environmental health, infant and maternal welfare, military and naval medicine, hospital and dispensary care, all contributed to the expansion of medical responsibility. A world of squalor and dejection, malnutrition and sickness, confronted practitioners whose new duties included the treatment of poor people.[14]

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[10] James Gregory, "Febres Continua," a lecture delivered in the 1788–89 academic year, p 1, Manuscript Collection, National Library of Medicine, Bethesda, Maryland (hereafter NLM).

[11] *Ibid.*

[12] William Cullen, Clinical Lectures, delivered between November 1772 and April 1773, p 132 Manuscript Collection, Royal College of Physicians, Edinburgh (hereafter RCPE) For an overview of eighteenth-century fever classifications see Lester S King, "Of Fevers," in King, *The Medical World of the Eighteenth Century* (Chicago University of Chicago Press, 1958), chap 5, pp 123–55

[13] Gregory, "Febres Continua," p 8, and William Buchan, *Domestic Medicine,* enlarged from author's rev ed. (New York R. Scott, 1812), pp 129–30 The first edition of Buchan's work appeared in Edinburgh in 1769

The suggestion that perhaps environmental conditions were accountable for the formation of a typhus-causing contagion was not too unreasonable. Army practitioners such as Pringle were quite conscious of the sanitary deficiencies in army camps and field hospitals; similarly the lack of hygiene on ships exacted a very high toll in disease among the crews, curtailing commercial and military voyages.[15] With housing always scarce, British cities had stashed multitudes of newcomers into narrow, windowless rooms where disease became a frequent visitor. Congested jails and work houses were also prominent sources for the contagion. Novel jobs and methods of labor associated with the incipient Industrial Revolution created further health hazards.[16] In sum, political programs, economic interests, and social forces all conspired in Britain to create a new ecology of disease in which a sickness labeled "typhus fever" played a major role.

Attentive physicians quickly realized that conditions in barracks and jails were quite similar to those encountered in crowded urban slums or countryside farmers' cottages. To explain the sudden appearance of typhus fever in these institutions and dwellings, physicians postulated the spontaneous generation of a poison, a contagion, arising within the stale air of confined spaces saturated with the exhalations emitted by too many dirty bodies crowded into single rooms. Part of the disease-causing matter was just simple perspiration. This combined with vapor emanating from dirty clothes, decaying foodstuffs, and plain filth on walls, floors, and ceilings. The hypothetical, invisible contagion could be inhaled, swallowed, or transmitted directly by skin contact, but only within a limited radius from its actual source. The persons most susceptible to the poison were said to be those already weakened through malnutrition, excessive work, or previous illness. Debility seemed to be at the very root of this fever.[17]

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[14] For an analysis of Enlightenment medicine see Peter Gay, "Enlightenment. Medicine and Cure," in Gay, *The Enlightenment An Interpretation,* 2 vols (New York: Knopf, 1966–69), 2 12–23 A longer, historiographic essay was written by William F Bynum, "Health, Disease, and Medical Care," in George S Rousseau and Roy Porter, eds , *The Ferment of Knowledge Studies in the Historiography of Eighteenth-Century Science* (Cambridge. Cambridge University Press, 1980) pp 211–53 An excellent and concise overview is Caroline Hannaway's "From Private Hygiene to Public Health A Transformation in Western Medicine in the Eighteenth and Nineteenth Centuries," in Teizo Ogawa, ed , *Public Health* (Tokyo Saikon Publishing for the Taniguchi Foundation, 1981), pp 108–28

[15] For details see Peter Mathias, "Swords and Ploughshares The Armed Forces, Medicine, and Public Health in the Late Eighteenth Century," in J M. Winter, ed., *War and Economic Development* (Cambridge Cambridge University Press, 1975), pp 73–90

[16] For an example, see the anonymous story of "The putrid fever at Robert Peel's Radcliffe Mill," *Notes and Queries,* 1958, *203* 26–35 Conditions within the cities have been frequently described Anonymous, *Remarks on the Situation of the Poor in the Metropolis as Contributing to the Progress of Contagious Diseases* (London R. Noble, 1801), and William Black, "Life and Health in Eighteenth-Century London," in his *Observations Medical and Political on the Smallpox and Inoculation,* 2nd ed. (London. J Johnson, 1781)

Whether there had been a change in the nature of fevers and in the frequency of typhus was debated in Edinburgh, and local physicians assessed the contemporary importance of nervous fevers within the local panorama of febrile illnesses. Francis Home, the professor of materia medica, concluded in 1782 that "in Edinburgh a pure synocha is seldom seen, even among the commonality. The low fever of typhus nervosus is by much the most frequent among them."[18] Like other authors, Home also claimed that "present living habits" were to blame, causing a debilitated state of the body, and he singled out people between the ages of eighteen and thirty as most likely to succumb to the contagion. In the same year of 1782, one medical student, James Hutchinson, concluded in his Edinburgh doctoral dissertation entitled "The Mutation of Fevers Since the Times of Sydenham" that most fevers described by the famous seventeenth-century physician had been inflammatory in nature and therefore were no longer prevalent in Edinburgh and Britain.[19] Based on his experience with private patients and charity cases seen in the Edinburgh Infirmary between the years 1770–1800, James Gregory wholeheartedly agreed.[20] "Typhus" fever definitely seemed to be a new disease.

The new frequency of typhus fever among the sick poor and the availability of hospital care in some eighteenth-century British cities brought many persons suffering from these fevers to the admission rooms of charitable institutions such as the Edinburgh Infirmary. The acceptance of febrile patients, however, could introduce the dreaded contagion into the wards and thereby expose already hospitalized individuals to the additional dangers of an epidemic. Such a possibility seemed ever present, particularly if the wards lacked adequate ventilation and were as crowded and dirty as the living quarters of the poor. "It seems more than probable," explained Gregory, "that both the deficiency of good air and the great abundance of noxious effluvia contribute to make the air in hospitals bad, noxious, and almost poisonous."[21]

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[17] William Cullen, Clinical Lectures [delivered for John Gregory] Feb–Apr. 1772, p 301, Edinburgh, Manuscript Collection, RCPE, Gregory, "Febres Continua," p 9, see also the works of Pringle and Millar

[18] Francis Home, *Clinical Experiments, Histories and Dissections,* 2nd corrected ed (London. Murray, 1782), pp 13–14

[19] James Hutchinson, *De mutatione febrium e tempore Sydenham* (M D diss, University of Edinburgh, 1782) Part of the perceived changes in fever type might have occurred as a result of several influenza epidemics that visited Britain during the second half of the eighteenth century. For details see Guenter B. Risse, "Epidemics and medicine the influence of disease on medical thought and practice," *Bull Hist Med,* 1979, *53* 505–19

[20] James Gregory, *Additional Memorial to the Managers* (Edinburgh Murray and Cochrane, 1803), p 351

[21] *Ibid*, p 352

Thus, hospital practitioners admitting patients often faced the unpleasant task of keeping fever cases out, a proscription that could prevent disaster in the wards. Allowing possible typhus cases to enter the wards threatened the establishment's "benevolent designs" since a hospital-based epidemic could lead to an increased mortality among the patients already there. The ensuing negative publicity would keep prospective patients away from the hospital while possibly also decreasing public subscriptions. "There cannot surely be a greater contradiction in the nature of things than a disease produced by a hospital," commented John Aikin, a prominent author on hospital care, in 1771.[22]

But effectively barring entry to fever cases, one of the largest contingents of sick poor, virtually defeated the hospital's avowed charitable goals and could easily have jeopardized the donations necessary for the running of the institution. At the same time, removal of individuals with typhus fever from their wretched homes was considered an important preventive measure: it lessened the perils of contagion for other family members, neighbors, co-workers, and especially employers.[23]

To forestall, therefore, the outbreak of typhus—or as it was often called, "hospital fever," in the wards—administrators quickly adopted the recommendations of practitioners attached to the Royal Army and Navy who from experience stressed the need for adequate ventilation and cleanliness. Voluntary hospitals such as the Edinburgh Infirmary were built or remodeled following plans that favored the establishment of individual sections or wings provided with large floor-to-ceiling windows on both sides of the structure to ensure cross-ventilation. During winters, the Edinburgh managers secured additional air drafts in each ward through the use of fireplaces and connected ducts.[24] A daily fumigation routine using tar water or muriatic acid was believed to cleanse the air further. The authorities ordered that the tiled floors be mopped daily and the walls be periodically "whitewashed" with lime. The latter action was carried out at the Edinburgh Infirmary, for example, in the year 1780 following a brief epidemic of "putrid fever."[25] Efficient removal of human wastes through an adequate supply of chamberpots and their storage outside the wards was also encouraged. Such efforts to ensure institutional cleanliness were generally successful in smaller medical wards located in the wings of the Infirmary, and most patients suffering from fevers were sent there directly to isolate them from other hospital inmates. As a result, late in the century Gregory considered the women's fever ward to be

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[22] John Aikin, *Thoughts on Hospitals* (London J Johnson, 1771), p 19

[23] Gregory, *Additional Memorial,* p 348

[24] Robert Jackson, *Memorial Addressed to the Managers of the Royal Infirmary of Edinburgh* (Edinburgh Mundell & Son, 1800), pp 5–8

[25] According to the local historian William Maitland, all floors at the Edinburgh Infirmary were tiled "to guard against fire, vermin, and stench." See his work *The History of Edinburgh From its Foundation to the Present Time* , in 9 books (Edinburgh, 1756), Book 7, p 458 The incident of 1780 was communicated to John Howard, the famous philanthropist and reformer, by John Hope, one of the attending physicians See John Howard, *Appendix to the State of the Prisons in England and Wales* (Warrington Fyres, 1784), p 151

"cleaner and better ventilated than most bed chambers in Edinburgh," a judgment echoed by another attending physician, James Hamilton.[26]

If the Infirmary was able to achieve a measure of environmental hygiene and thus prevent the typhus contagion from spreading through the wards, it also had to pay attention to the personal hygiene of those individuals it admitted. Most arrivals, especially the men, were dirty with an "unpleasant foetor attached" to them and plenty of "vermin"—meaning lice. Immediately upon reaching the teaching ward after their admission, most fever patients were ordered to surrender their clothes and take a bath. Thereafter, they received a clean gown or shirt, although no explicit policy or regulation seems to have existed in Edinburgh to enforce these measures. Some patients also had their heads shaved and their skin was rubbed with mercurial ointment.[27]

Such prophylactic methods were not routinely carried out. They required special orders from the physicians in charge and their actual implementation depended very much on the resources of the Infirmary. Faced with a financial crisis late in the century, for example, the Edinburgh Infirmary experienced a shortage of water. Patients could no longer take full baths and the laundry facilities broke down, resulting in dirty bedsheets and clothing. Unfortunately, these and other periodic institutional shortcomings frustrated most professional goals of personal cleanliness.[28]

Nevertheless, efforts to insure hospital and personal hygiene usually seemed quite effective in alleviating the suffering of patients labeled as having typhus fever. In fact Gregory declared that he "would rather undertake the cure of any number of such patients with the help of cleanliness, pure cool air, and cold water without any medicines."[29] Since the term typhus was somewhat indiscriminately attached to a number of mild fevers that failed to display inflammatory symptoms, a therapeutic regimen based solely on environmental changes, rest, and diet often produced favorable results, especially if the patients sought admission soon after the onset of symptoms and before losing additional strength. "During eleven years of practice in the clinical ward I have not lost one fever patient in five of them," Gregory told his students, adding that "in the other six I only lost five to eight patients to typhus every year."[30] He and other practitioners urged that everyone afflicted with the disease come as soon as possible to the Infirmary for care. A clean hospital ward was "the best or only contrivance hitherto known for preventing the accumulation and virulence of such effluvia" responsible for the fever.[31]

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[26] Gregory, *Additional Memorial*, p 344 See also Royal Infirmary of Edinburgh, *Report of a Committee on the State of the Hospital* (Edinburgh, 1818), p 4

[27] *Report of a Committee*, pp 5–19

[28] *Ibid*, pp 3–12

[29] Gregory, *Additional Memorial*, p 349

[30] Gregory, "Febres Continua," p 7

[31] Gregory, *Additional Memorial*, p 353.

Table 1 Royal Infirmary of Edinburgh (1779–99) "Typhus" fever—112 cases
Distribution by casebook and sex

Casebooks		Males	Females
Gregory	1779–80	2	9
Hope	1781	3	—
Gregory	1781–82	15	8
Gregory	1785–86	—	12
Gregory	1787	—	9
Gregory	1787–88	4	13
Home	1788–89	3	3
Gregory	1789	2	4
Gregory	1795–96	3	7
Rutherford	1799	1	14
	Total	33 (30%)	79 (70%)

Several student casebooks containing more than 1000 clinical histories of patients admitted to the teaching ward of the Edinburgh Infirmary confirm most of the physicians' statements about typhus fever.[32] Between the years 1779 and 1799, 112 cases were diagnosed as "slow nervous fever" or "typhus," and records of these patients constitute the basis for the analysis that follows. More than two-thirds of the patients were females (see Table 1), a fairly large number of them servants, probably brought to the institution on the orders of anxious masters who feared the spread of contagion in their households. A majority were young adults, with the males somewhat older than the females (see Table 2).

"In the language of this country, the vulgar, if they are hot, say that they are in a fever," wrote George Fordyce, one of the most prominent experts on fevers in the late eighteenth century. Yet, practitioners had to be cautious since fever was a fickle symptom "least to be depended upon" in making a diagnosis.[33] Most of the incoming patients whose histories were recorded in the Edinburgh casebooks, however, seemed to have complained of a fever. They generally related to hospital practitioners a story of gradual malaise, anorexia, persistent bouts of chills and heat, severe headaches, and progressive weakness. These symptoms frequently followed exposure to relatives or friends already affected by a similar ailment.

The average patient accepted as a "typhus" case by the Infirmary had had acute complaints for five to nine days before entering the hospital, and

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[32] The student casebooks generally provide the complete clinical record of Infirmary patients presented by the Edinburgh professors during lectures Each case was copied from the ward-journal and individual notebooks include about sixty to sixty-five histories detailing the daily clinical management of the patients The majority of these casebooks are to be found in the manuscript collections of the Royal College of Physicians, Edinburgh, Medical Archives, University of Edinburgh; and the National Library of Medicine, Bethesda.

[33] George Fordyce, *A Dissertation on Simple Fever* (London J Johnson, 1794), p. 6 One-third of the female patients reported an occupation, 95 percent of them were listed as servants Among the males, two-thirds are listed with occupations, 38 percent were soldiers, 23 percent servants

Table 2 Royal Infirmary of Edinburgh (1779–99) "Typhus" fever—112 cases
Average age of patients (years)

Casebooks			Males	Females
Gregory	1779–80		37	16
Hope	1781		47	—
Gregory	1781–82		21	26
Gregory	1785–86		—	20
Gregory	1787 .		—	21
Gregory	1787–88		33	24
Home	1788–89		29	24
Gregory	1789		31	27
Gregory	1795–96		19	24
Rutherford	1799		23	22.3
		Average	27	23

about half of the patients said that they had received treatments prior to being hospitalized. Information about the symptoms of a small contingent of incoherent and delirious individuals was much more difficult to gather. Their "indistinct" accounts had to be supplemented by those of the family members or neighbors who had brought them to the hospital. Delirium not only hampered history-taking but created immediate problems for the porters and nurses called to subdue—often with the help of a strait-jacket—those "furious and impetuous" patients severely affected by the fever. Others simply remained confused or drowsy, crying or muttering to themselves instead of screaming into the night.[34]

In Edinburgh the clinical history was routinely complemented by a rudimentary physical examination that included a general body inspection, pulse-taking, and visual scanning of the tongue and throat. Although small thermometers were available at the time and usually placed under the tongue, unreliable readings discouraged their use.[35] Instead, physicians relied on pulse counting and its evaluation, correlating a strong but fast pulse with inflammatory fever and a weaker, slower one with typhus. The tongue was usually dry and coated, and a few patients displayed a petechial rash on chest and abdomen. A cough with scant expectoration and extreme prostration was frequently noted by the examining physician

Given the professional perception that typhus fever was the effect of systemic debility, the goal of medical treatment was to strengthen the patient and ameliorate the most bothersome symptoms. The intent was to "conduct the patient through the disease" with a minimum of additional harm while restoring vigor to the body and thereby allowing its natural healing forces to expel the contagion.[36]

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[34] This, for instance, was the case for Isabel MacDonald, in James Gregory, Clinical Notes and Lectures, Edinburgh 1779–80, Manuscript Collection, RCPE, and for Jane MacPherson, in James Gregory, Clinical Reports, Edinburgh 1795–96, Manuscript Collection, Medical Archives, University of Edinburgh.

[35] Fordyce, *Simple Fever*, p 9

Such an objective was sought with the help of a stimulating regimen employed for centuries to hasten the convalescence of fever patients. The key phrase was "recruiting the body by food and sleep," with orders for a nourishing diet: barley water, bread, seasonal fruits, beef broths with bits of roasted meat, and sips of wine as demanded by the patient.[37] Meat and wine were definitely regarded as powerful tonics and therefore key elements of the invigorating plan. At the Infirmary, red wine was preferred, usually diluted with water, and the standard formula called for eight ounces of wine in four ounces of water, served three or four times daily. For more serious cases requiring stronger stimulation, physicians prescribed undiluted house wine: a half to one and a half pints per day, or port, two ounces every four hours. In the sample under study, half of the patients received a prescription for wine (see Table 3). Those who disliked drinking wine received daily two or three pints of porter, a sweet and dark ale.[38]

Several clinical histories contain a number of remarks regarding the patients' reactions to such dietary orders. For instance, such statements as she "longs very much for her meat and wine," "he is desirous to have a bit of roast meat," "she has very little complaint but from a want of wine," "he relishes the wine very much" reveal the enthusiasm expressed by the recovering hospital patients concerning their dietary regimen.[39] Indeed, once their appetites returned, some individuals took advantage of their convalescent condition to demand further food and drink. If the hospital's financial status allowed it, the nurses brought supplies of raw, "undressed" meat directly to the teaching ward and allowed the ambulatory patients to roast it in the fireplaces before eating it with potatoes and turnips.[40] In 1789 for example, one forty-two-year-old male, a patient of Francis Home, received a total of thirty-four ounces of wine in the twenty-four hours between physicians' visits.[41]

The most frequently used drugs were analgesics, generally opiates, prescribed for the symptomatic relief of generalized pains, backaches, abdominal cramps, cough, and severe headaches. "My practice in fevers," explained Gregory, "is merely palliative; my principal indications are to relieve symptoms and to suffer the disease to bring itself to a conclusion."[42] Other hospital

[36] George Fordyce, *A Third Dissertation on Fever*, 2 parts in 1 vol (London J Johnson, 1798–99), part 1, p 151

[37] *Ibid.*, p 247

[38] See the prescriptions in James Gregory, Clinical Cases, Edinburgh 1789, Manuscript Collection, NLM.

[39] Cases of Elizabeth Fraser, in John Gregory, Clinical Cases, Edinburgh 1771–72, Manuscript Collection, Medical Archives, University of Edinburgh, Edmund Trimmer and John Black, in James Gregory, Cases of Patients, Edinburgh 1781–82, Manuscript Collection, RCPE

[40] Royal Infirmary of Edinburgh, *Report of a Committee*, pp 64 and 91

[41] Case of David McDonald, in Francis Home, Clinical Cases, Edinburgh 1788–89, Manuscript Collection, NLM.

[42] Gregory, "Febres Continua," p 20

Table 3. Royal Infirmary of Edinburgh (1779–99) "Typhus" fever—112 cases
Treatment methods (all notebooks)

Measures	Frequency
Anodynes or analgesics	80%
Wine	50%
Purgatives	44%
Emetics	40%
Diaphoretics	39%
Tonics	38%
Blisters	38%
Fomentations	25%

practitioners such as Cullen and Home agreed, all of them ordering liquid laudanum, especially at bedtime, to stop pain or relieve the agitation of a delirium, thereby ensuring a more restful night. The drug worked so effectively that physicians were elated with the results, casting aside previous reservations. Gregory, for example, admitted using "large doses of opium without scruple," apparently being unaware of its addictive qualities.[43] From the clinical histories it is apparent that women patients received analgesics more frequently than men in conformity with contemporary views that the female constitution was more sensitive to pain. Indeed, complaints of generalized pains and headaches appeared four times as frequently in the charts of women patients as in those of the opposite sex.

In the cases used for this study, Edinburgh physicians prescribed emetics and purgatives for almost half of all typhus fever patients (see Table 3). Practitioners speculated that the lack of appetite and nausea frequently accompanying febrile states reflected weakness and excessive relaxation of the stomach's muscular fibres. Vomiting, therefore, was interpreted as a manifestation of the body's own healing powers trying to unload undigested foods that were trapped because of gastric debility. If vomiting failed to occur spontaneously, physicians decided to imitate nature and early in the course of the fever prescribed an emetic drug to accomplish the task. In Edinburgh, the commonly employed products were the root of ipecacuanha and preparations of antimony. A favorite of Cullen and Gregory for "washing out the stomach" was tartar emetic—antimonial potassium tartrate—which also had purgative qualities.[44]

With the doctrines of traditional humoralism in mind, physicians also persisted in believing that the lower portions of the *prima-via* or digestive tract needed to be similarly evacuated. In fevers, removal of hardened feces,

[43] *Ibid*, p 26 Most Edinburgh practitioners prescribed an *baustus anodynus* or analgesic draught containing between twenty and forty drops of laudanum to be given at bedtime but this was also repeated at times at least once during the day

[44] *Ibid*, p 16 See also Bartholomew Parr, "Emetica," in *The London Medical Dictionary*, 2 vols (Philadelphia Mitchell, Ames, and White, 1819), 1: 600–604, and William Cullen, Clinical Lectures, 1772–73, pp 138–41

which could pose a danger if they were partially absorbed or mechanically blocked intestinal secretions, was imperative. Here again, spontaneous diarrheas pointed to nature's way. Once cleansed, the bowels were in a position to absorb new nutriment and thereby contribute to recovery

Before employing drugs, however, Edinburgh physicians tried to remove the usual constipation associated with fevers through the administration of saline enemas and ingestion of ripe fruits. When they failed in such endeavors, they ordered aloes, rhubarb, jalap, or senna in powders or infusions, magnesium, and sodium sulphate. Among mercurial preparations, calomel or mercurous chloride was "one of the most certain and effectual" according to Cullen.[45] Gregory, for his part, cautioned students about the dangers of excessive purgation in typhus since it could delay convalescence and therefore prolong hospitalization.[46]

Another type of drug ordered for about a third of the typhus fever patients at the Infirmary was one designed to promote perspiration. Physicians interpreted diaphoresis as a natural cleansing reaction capable of discharging vapor and sweat together with any residual morbid matter still lodged near the surface of the body. Since the phenomenon generally coincided with the waning of fever and the onset of convalescence, practitioners believed in its systemic usefulness, seeking to create or augment it whenever they discerned a clinical shift for the better. While most sweating was easily produced by the application of heat—warm baths or fomentations—or wearing flannel shirts, the Edinburgh hospital staff also prescribed a number of draughts, teas, and juleps using sage, mint, snake root, sarsaparilla, and common salt.[47] Both Cullen and Gregory preferred the hospital-prepared *julep salinum* containing salt, lemon juice, mint water, and syrup that "excited gentle diaphoresis." Gregory admitted that it was "a mere placebo: when the patient is taking it, he thinks it is some powerful medicine and so it may prove useful."[48]

Since typhus fever was believed to be the result of a debilitated state of the body, physicians not only promoted the use of stimulating measures such as purgation and diaphoresis, but they also prescribed a variety of preparations considered to be tonics. Within Cullen's system, which was widely accepted in Edinburgh's medical circles, tonics were said to increase the general tone or strength of the body by propping up the muscular fibres of organs as diverse as the stomach and the blood vessels. Other authors merely thought that the drugs listed under that rubric "supported the *vis vitae*" or vital force responsible for life.

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[45] Parr, "Cathartica," in *London Medical Dictionary,* 1 374–78 See also William Cullen, *A Treatise of the Materia Medica,* 2 vols (Edinburgh J Cruikshank and R Campbell, 1789), 2 333–68, and Cullen, Clinical Lectures, 1772–73, p 81

[46] Gregory, "Febres Continua," p 44.

[47] Parr, "Diaphoretica," in *London Medical Dictionary,* 1 552–55 See also Andrew Duncan, Sr , *Elements of Therapeutics,* 2 vols , 2nd ed. (Edinburgh. Drummond, 1773), 2 23–33

[48] Gregory, "Febres Continua," p 37

Among the tonics were so-called bitters promoting appetite and digestion after the fever had receded. The most popular preparation, however, was the Peruvian bark or *cortex peruvianus,* containing quinine. Its most favorable effects seemed to occur in the treatment of intermittent fevers—many of them probably malarial. By the 1780s the bark's newly acquired popularity prompted its use during the remissions of typhus fevers (clinically quite similar to quartan intermittents) in an effort to secure equally beneficial results. Cullen prescribed it almost routinely but Gregory remained somewhat skeptical about its usefulness. For better or worse, the decoctions of Peruvian bark employed at Edinburgh "sat" badly in the patients' stomachs and often caused enough nausea and vomiting to force their termination.[49]

Although blisters were part of the traditional methods of counterirritation originally believed to expel noxious fever-producing humors from the body, these treatments remained in the physician's therapeutic arsenal. The rationale for their use was simply recast to conform to the new neuropathological views. Thus, in late eighteenth-century Edinburgh, blisters were stimulating procedures appropriately prescribed for over a third of the debilitated patients in the sample (see Table 3). The practice consisted of selectively producing a number of running sores on several areas of the body for the purpose of draining harmful substances. To establish a blister, practitioners applied on the skin an adhesive dressing containing a highly irritating powder or ointment made of mustard flour or Spanish flies. Such products were traditionally placed behind the ears, on the shaven crown of the head, on the nape of the neck, between the shoulders, on the chest, or abdomen. The skin usually "answered" within twelve to twenty-four hours by "rising" and forming a vesicle that was repeatedly pierced and allowed to drain fluid. Then, for the next two or three days, the blisters were periodically dressed but they quickly dried up unless the irritants were reapplied to promote further discharge. Such successive, carefully timed placements were part of the so-called "blistering schedules" popularized earlier in the century.[50]

Because of the pain and the danger of secondary infection, patients at the Infirmary resisted the application of blister-forming dressings, often refusing them outright and even leaving the hospital if they were well enough to walk. Cullen was dubious about the blisters' ability to stimulate the entire body and Gregory rejected their use altogether, telling his students that "I never saw any advantage arise from them."[51] To the chagrin of their patients at the Edinburgh Infirmary, Francis Home and Daniel Rutherford remained staunch adherents of a blistering schedule in typhus fever.

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[49] Cullen, *Treatise of Materia Medica,* 2 59–77 and by the same author, Clinical Lectures 1772–73, p 36 Examples are the cases of Sophia Martin, in James Gregory, Clinical Cases, Edinburgh 1785–86, Manuscript Collection, Medical Archives, University of Edinburgh, and Betty Christie, in James Gregory, Clinical Cases, Edinburgh 1787, Manuscript Collection, NLM

[50] Parr, "Blisters," in *London Medical Dictionary,* 1. 254–56 They were applied, for example, in the cases of Mary Nisbet and Jane Ford in Francis Home, Clinical Cases, Edinburgh, 1788–89 Cantharides or Spanish flies are small green-colored insects used for centuries as a therapeutic agent. After being reduced to a dry powder, the cantharides were mixed with alcohol, oils, or water and employed as irritants both for external and internal use.

One out of every four patients in these Infirmary cases received fomentations. Such activities were in part carried out as a substitute for warm baths when there were hot water shortages. Just as for mild diaphoresis, the purpose was largely to relieve symptoms. creating a relaxing and soothing effect that would decrease the violence of a delirious fever and promote nocturnal sleep. Flannel cloths, dipped in very hot water, were placed on the patients' legs for about half an hour before bedtime or two to three times daily if the individual was quite agitated and confused. Cullen, who realized the impossibility of providing enough hot bathing water for all Infirmary patients, strongly recommended fomentations for the control of febrile symptoms, even speculating that the favorable results stemmed from a "sympathy" between the treated skin surface and the rest of the organism.[52]

Among other procedures listed for the symptomatic treatment of typhus fever was the application of cold water and air. If the headaches became unbearable, physicians ordered the nurses to place cold water compresses on the forehead of the patient or to pour the water over the shaven scalp. The forehead could also be massaged with water and vinegar. Constant streams of cold air were believed to control high fever.[53] Finally both temples were at times scarified and cupped for the removal of about four to eight ounces of blood.

Bloodletting, a key measure of the traditional anti-phlogistic regimen frequently employed in fevers, was not an important therapeutic procedure used in typhus fever. Decades earlier, Hillary and Huxham had discovered that their typhus patients tolerated the withdrawal of blood poorly, and had warned repeatedly in their writings against the practice. Late eighteenth-century physicians observed similar unfavorable results from bloodletting, including an exacerbation of the patients' weakness and significant delays in convalescence. "I am every day more and more convinced of its inutility," commented Gregory.[54] Thus, the clinical records of those 112 individuals admitted to the Edinburgh Infirmary reveal less than a handful of instances in which venesection was prescribed, and then only when bedside observations by the practitioner showed a shift in the patient's condition from typhus to an inflammatory type of fever. Bloodletting, one of the most popular medical therapies, was indeed virtually abandoned in the treatment of typhus, encouraging Gregory to say that "a complete revolution seems, in-

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[51] Cullen, Clinical Lectures, 1772–73, pp 150–52, Gregory, "Febres Continua," p 19

[52] Cullen, Clinical Lectures 1772–73, pp 163–64 See the cases of Mary Dunn and Peggy Maitland, in Daniel Rutherford, Clinical Cases, Edinburgh, 1799, Manuscript Collection, RCPE

[53] Gregory, "Febres Continua," pp 25–26 Cases of Janet Joy and James Thomason, in James Gregory, Cases of Patients, Edinburgh, 1781–82

[54] Gregory, "Febres Continua," p 18

Table 4 Royal Infirmary of Edinburgh (1779–99) "Typhus" fever—112 cases
Average length of hospitalization (days)

Casebooks		Males	Females
Gregory	1779–80	15	20
Hope	1781	33	—
Gregory	1781–82	17	22
Gregory	1785–86	—	15
Gregory	1787	—	7
Gregory	1787–88	10	31
Home	1788–89	8	25
Gregory	1789	13	20
Gregory	1795–96	15	20
Rutherford	1799	8	16
	Average	15	20

deed to have taken place in this respect, especially among practitioners here."[55]

The inherently conservative regimen instituted by Edinburgh physicians for the treatment of typhus fever led to favorable results. To be sure, most individuals were young and without a history of previous health problems. Some probably just suffered from mild fevers mistakenly included under the label "typhus." All patients remained in the Infirmary for two to three weeks, half of that time being spent recuperating from their disease (see Table 4). The shorter average hospitalization for men resulted in part from the early death of some individuals. Women, as a rule, stayed somewhat longer because of recurrent complaints of headaches and delirium. Many were kept in the hospital even when progress reports indicated that they were in a convalescent state. In general, it was felt that females were more debilitated after their bouts with typhus and therefore needed more time to fully recover.

The institutional mortality figures for typhus fever were significantly higher for men than women (see Table 5). About one in four male patients died of the disease, a statistic that compares unfavorably with the hospital's average mortality rate of 4 percent, and an 8 percent rate for the teaching ward in the same period.[56] By contrast, females infrequently died in the institution but a fair number of them were discharged from the Infirmary as "relieved," a very ambiguous term that merely implied symptomatic improvement.

[55] *Ibid*, p 19 One notable exception was the case of Elizabeth Gibson, a patient treated by Gregory with bloodletting in December 1795, who displayed symptoms of pneumonia. Another case was George Grant, a patient of John Hope seen in August 1781 His headaches became so intense that the attending physician ordered an eight-ounce bleeding from the individual's temporal arteries

[56] The Infirmary's yearly admission and discharge statistics, published in the *Scots Magazine*, reveal fluctuations in the death rate of between 3 and 5 percent in the decades under study Mortality rates for the teaching or "clinical" ward, calculated on the basis of 3,047 entries in the General Register of Patients averaged 7.6 percent between the years 1770 and 1800

Table 5 Royal Infirmary of Edinburgh (1779–99) "Typhus" fever—112 cases
Outcome of hospitalization

Casebooks		Males		Females	
		cured	dead	cured	dead
Gregory	1779–80	2 (100%)	—	9 (100%)	—
Hope	1781	2 (66%)	1 (33%)	—	—
Gregory	1781–82	14 (93%)	—	8 (100%)	—
Gregory	1785–86	—	—	10 (83%)	—
Gregory	1787	—	—	7 (77%)	1 (11%)
Gregory	1787–88	4 (100%)	—	10 (76%)	—
Home	1788–89	—	3 (100%)	3 (100%)	—
Gregory	1789	1 (50%)	1 (50%)	3 (75%)	—
Gregory	1795–96	1 (33%)	2 (66%)	4 (57%)	1 (14%)
Rutherford	1799	1 (100%)		10 (71%)	1 (7%)
	Total	25 (75%)	7 (21%)	64 (82%)	3 (4%)

Practitioners were familiar with those symptoms that suggested an adverse outcome. Some debilitated patients would have nosebleeds, others lost blood in their stools. There were individuals with tremors, some were comatose, while a few complained of visual disturbances, such as seeing black spots on bedclothes and in the air, the latter being confused with flies "I am myself an instance of recovery from such a deprivation of sight," admitted Gregory to his students, a revealing comment that explains the interest that this Edinburgh professor expressed in typhus and its management.[57] More ominous, of course, were the "putrid exhalations," the stench from gangrenous bed sores and decaying toes and fingers. These areas were repeatedly treated with poultices and dressings by surgical consultants in an attempt to promote suppuration, drainage, and eventual healing.

Studying the clinical histories of the Edinburgh Infirmary in detail, it appears that most male patients admitted with a diagnosis of typhus fever were seriously ill, displaying symptoms characteristic of louse-borne typhus or relapsing fever as defined in modern times. They usually had suffered for about a week before admission and were in poor physical health.[58] Gregory felt that neglected or mismanaged patients who came to the hospital had almost no chance to recover. "Sometimes they are absurdly bled, purged or sweated till their strength is entirely gone," he observed.[59] Five of the seven deaths occurred within one to seven days following admission.

Women patients, on the other hand, had milder symptoms and paradoxically received more treatment, especially palliation for their complaints of pain and frequent attacks of delirium. Moreover, some of the statistically significant differences probably stem from the fact that a good number of the females with typhus were servants whose previous good health and prompt admission favorably influenced the eventual outcome.

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[57] Gregory, "Febres Continua," p 29.

[58] According to the information obtained from the patients and recorded in the clinical histories, males were on an average sick for 7.2 days prior to admission. The figures for female patients were nearly identical 7.1 days Fifty-one percent of the men had received some form of treatment before coming to the hospital, only 43 percent of the women had done so

[59] Gregory, "Febres Continua," p 4

In sum, as a consequence of policies based on Enlightenment ideology, eighteenth-century physicians gradually came into contact with many patients belonging to the lower orders of society, especially in hospitals. As a result, medical practitioners were confronted with a much larger number of cases and a greater variety of diseases than at any previous time in history. Among the newly discerned health problems were the so-called slow nervous or typhus fevers, diseases that clinically behaved quite differently than the traditional inflammatory varieties. Their relative frequency, caused by a number of biological and social factors operating during the eighteenth century, resulted in the belief that a significant change in disease type had indeed occurred in Britain. Such an awareness prompted adjustments in existing nosological systems and revisions of therapeutic strategies.

In Edinburgh, the label "typhus fever" helped physicians filter and shape their new clinical experiences. It also compelled them to recast their theories and practices—witness the emergence of Brunonianism, the medical system of John Brown[60]—to try to reconcile the new knowledge with previous observations and understandings. In hospital settings such as the Edinburgh Infirmary, new criteria for institutional hygiene were developed together with a supportive regimen of treatment that relied primarily on personal hygiene, rest, and diet. As the study of 112 individual cases confirms, hospital practitioners not only exercised caution in the employment of drugs and physical methods of treatment, but also developed specific criteria for their use based on clinical effectiveness rather than arbitrary theoretical guidelines.

The therapeutic moderation reflected in these late eighteenth-century clinical histories needs to be emphasized since the roots of a subsequent activism in treatment—often termed "heroic"—have repeatedly been traced back to the Edinburgh Medical School.[61] From the extant records, experienced clinicians such as Cullen, Gregory, Home, and others seemed to proceed cautiously in an institutional milieu that also served as a teaching center and training ground for future physicians. Under the watchful eye of colleagues and students, physicians prescribed simple drugs, often in variable dosages and preparations, following a consistent therapeutic rationale. In the end, the story of how these eighteenth-century hospital practitioners in Edinburgh coped with "typhus" contradicts two popular historical notions: the

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[60] For details, see Guenter B Risse, "The Brownian system of medicine its theoretical and practical implications," *Clio Medica*, 1970, *5*. 45–51

[61] See Martin Kaufman, "The Age of Heroic Medicine," in his *Homeopathy in America The Rise and Fall of a Medical Heresy* (Baltimore The Johns Hopkins University Press, 1971), p 1, and John S Haller, "The Aging Materia Medica," in his *American Medicine in Transition, 1840–1910* (Urbana, Ill University of Illinois Press, 1981), p 78

McKeown thesis that all contemporary hospitals were "death traps"[62] and the often repeated allegation that at that time the medical profession killed more patients than it could cure.[63] Whether the clinical activities at the Edinburgh Infirmary constituted the norm rather than the exception will, however, require further studies.

APPENDIX

The following case, copied from one of the students' notebooks, illustrates the Infirmary's approach to typhus fever. Gregory was the attending physician The patient entered the hospital after five days of chills and fever and was initially given opiates and subjected to the almost routine cleansing of the digestive tract. The high fever and delirium were managed through applications of cold water. From the outset, Gregory instituted a stimulating plan of treatment based on the use of tonics—the Peruvian bark—wine and beer, but the patient's condition worsened in the first week of hospitalization. Gregory's free use of opiates should be noted Although the draughts controlled a number of symptoms and helped the patient achieve a necessary measure of rest, increased doses were required toward the end to achieve such effects.

After ten days in the hospital, the patient seemed to be on the mend, with a normal pulse and the return of appetite. At this point the attending physicians expressed doubts about the nature of her persisting "delirium," ascribing it to her previous mental state rather than the fever Their speculations, however, were deflected by the occurrence of two complications common in louse-borne typhus: parotiditis and gangrene. The latter could have been simply a bedsore arising in a bedridden, incontinent patient In any event, the house surgeons were called in and both lesions were brought to suppuration and then successfully drained Although the casebook notes the onset of a convalescent state by 15 January, the patient remained in the hospital at least until 26 January, the date when all cases still remaining in the teaching ward were either dismissed or transferred to other units since Gregory's rotation was ending.

Patient: J.S.
Notebook: Clinical cases, by James Gregory, Edinburgh 1787–88
Location Manuscript Collection, National Library of Medicine, Bethesda.
Age. 28, married
Sex: Female
Admitted: 5 December 1787, to the teaching ward

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[62] The earliest statement regarding the dangers of eighteenth-century hospitalizations can be found in Thomas McKeown and R G Brown, "Medical evidence related to English population changes in the eighteenth century," *Pop Stud*, 1955–56, *9* 125 Another historian, following McKeown's lead, characterized eighteenth-century hospitals as "gateways to death". K F Helleiner, "The Vital Revolution Reconsidered," reprinted in David V Glass and D E C Eversley, eds, *Population and History* (London Arnold, 1965), p 84 The latest version of this thesis can be found in Thomas McKeown, "Food, infection, and population," *J Interdisc Hist*, 1983, *14*· 228, as well as in comments made by Lawrence Stone in "Madness," a book review, *The New York Review of Books*, 16 December 1982, *29* 28

[63] A prominent representative of this concept is Lewis Thomas See "Medical Lessons from History," in his book *The Medusa and the Snail More Notes of a Biology Watcher* (New York: Viking Press, 1979), pp 159–60

Diagnosis Typhus fever
5 December 1787· Was attacked on the 30th of last month with rigors alternating with hot fits, headaches, languor, and other precursory symptoms of fever. Complains at present of much headache, pain of loins, nausea, anorexia and some vomiting, with general uneasiness. Pulse 102—skin hot—tongue furred—thirst urgent—belly slow—catamenia regular but very scant. Had an emetic on the 4th day of the attack without any relief—knows no cause for her complaints. Give saline julep 1½ oz every three hours and antimonial solution until vomiting occurs.

6 Antimony solution operated briskly upwards and downwards—pulse 108—heat moderate—tongue clean and moist—anorexia and thirst—bad sleep—much general uneasiness—repeat saline julep—add Peruvian bark powder 1½ oz six times daily—domestic wine 1½ oz per day—analgesic draught with 30 drops of laudanum at bedtime—Beer as much as patient desires

7 Pulse 114 and very soft—stool and urine in bed—in other respects as yesterday—continue medications—to have red wine 2 lbs mixed in 1 lb of water daily—6 PM—hair of head shaved off—apply cold water mixed with vinegar—give the analgesic draught at 11 PM

8 Pulse 114—much delirium—urine still passed in bed—was quiet and slept some after the anodyne draught—frequent fits of shuddering and tremor—repeat draught, wine, and cold water applications to the head—the analgesic can be given every six hours if needed.

9 Became quiet after the draught but violently delirious again about midnight when the draught was repeated—has been pretty quiet ever since—no stool and urine passed in bed—tongue parched—much thirst—no appetite—no tremors nor return of the shuddering—pulse 132—eyes red—inject common enema in evening—repeat analgesic draught, wine and beer—

10 Pulse 126—still regular and of moderate strength—violent delirium after midnight quieted by the draught—great stupor ever since—small stool obtained from enema—urine still passed in bed—extremities still warm—breathing somewhat laborious—deglutition imperfect for the last three hours—omit the draught—repeat cold water washings and give the wine—

11 Last night pulse 136, complete stupor—laborious breathing—about two o'clock in the morning she became easier but much delirium since—pulse now 108, heat moderate—tongue getting moist—deglutition perfect—urine still passed in bed—no stool—inject another enema with tepid water—repeat wine and beer

12 Enema operated—still violent delirium—pulse 96, of good strength and regular—heat moderate—tongue getting clean—continue

13 Pulse near 120—tongue more parched—less delirium in the night but much at present—no stool— urine passed in bed—no appetite—She will not take the wine—omit it—continue applications of cold water—beer—

14 Enema has operated—pulse still 120—much delirium—little sleep—give analgesic draught again with 20 drops of laudanum

15 Pulse 96—heat moderate—no effect from the draught—violent, permanent delirium, almost like mania—appetite pretty good—bowels costive—omit the draught—repeat enema

16 Pulse 84—very outrageous delirium—it appears that before the attack of the fever she had been much disordered by a violent fright—appetite pretty good—

maniacal state more plain—let her have a milk diet morning and evening with bits of meat for dinner—1 lb of porter a day—

17 Continues perfectly maniacal

18 Pulse between 80 and 90—considerable swelling of the face—had her anodyne with 30 drops of laudanum at 9 PM at night and another between 11 AM–12 noon—less delirium, even during evenings—pretty good sleep since 2 AM—appetite as formerly—

19 Pulse almost natural—She was restless and delirious till past midnight, then got one of the draughts—has slept a good deal and been more quiet since—sometimes speaks more sensibly—face still swollen—appetite pretty good—urine passed in bed—no stool—repeat enema

20 Pulse 72—much less delirium—great painful parotid swelling on the left side—apply 8 leeches to the site and dry heat

21 Leeches bled freely—less swelling—no more delirium—one of the glands in the axilla swollen and painful—apply poultice to parotid and axilla—evident fluctuation

24 House surgeon to examine and operate on the abscess as soon as possible—pulse 84—skin cool

25 Pus discharged—still discharging—good sleep—appetite good—continue Peruvian bark powder

27 Pain from some excoriation of the back of the hip which she scratches frequently—analgesic draught with 60 drops of laudanum at bedtime—30 drops during day

28 Discharge continues from the ulcer—much easier since the draughts

31 House surgeon to examine and dress the sores

1 January 1788 Sore on the hip very deep and painful—she will not allow the poultice to remain on it—reapply the poultice, repeat analgesic draught and place in the jacket again—

12 Much discharge from ulcer on the hip—pulse 96—

15 Convalescent

16 Footbath—feet dry—cuticle scaling off—

26 Diarrhea—omit Peruvian bark—no diarrhea since— (End of Gregory's clinical rotation—patient probably discharged cured)

TREADING THE ELEPHANT'S TAIL: MEDICAL PROBLEMS ON THE OVERLAND TRAILS*

Peter D. Olch

A common expression among the emigrants on the overland trails to California and Oregon, particularly in the 1840s and 1850s, was "to see the elephant" or derivations such as "we have seen the elephant's footprint" or "we have tred the elephant's tail." It generally meant that they had gained experience by undergoing hardship, had faced a particularly severe ordeal, or had learned the realities of a situation firsthand.[1] If one examines the medical problems experienced by many of the individuals who embarked on either the four-and-a-half month, more than 2,000-mile trek from the Missouri River on the Oregon-California Trail or traveled one of the overland routes through the Southwest, the use of the expression seems quite appropriate.

The most reliable estimate of the number of overland travelers westward on the Oregon-California Trail during the quarter of a century between 1841 and 1866 is 350,000. In 1850 alone, 55,000 individuals traveled the best known and most fully tested route through South Pass on the Oregon-California Trail.[2] South Pass is located on the Continental Divide in the central Rocky Mountains in what is now the state of Wyoming.

Prior to 1849, the few emigrants who did not travel on the Oregon-California Trail reached the Pacific coast either by sailing around Cape Horn or by following the Sante Fe Trail from Independence, Missouri, and then continuing in a northwesterly direction from Santa Fe on the old Spanish

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[1] J Rea, "Seeing the elephant," *Western Folklore*, 1969, *28* 21 and Peter Tamony, "To see the elephant," *Pacific Historian*, 1968, *12* 23

[2] Merrill J Mattes, *The Great Platte River Road*, 2nd ed (Lincoln· Nebraska State Historical Society, 1969), p 23

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Trail. From 1849 through 1860, many westbound travelers chose routes other than that through South Pass. The long sea voyage around Cape Horn was still popular, particularly with those emigrants starting on the eastern seaboard, as was the two-part sea voyage incorporating the crossing of Panama. However, some 9,000 forty-niners and lesser numbers of emigrants in subsequent years traveled the southwestern trails to California, such as the Santa Fe and Gila Trails. There were also several routes across Mexico which were traveled by many gold seekers in 1849 and 1850. The hardships of the southwestern and Mexican routes were soon publicized and relatively few emigrants used them in subsequent years.[3]

This paper is based on the examination of approximately 450 trail diaries and journals. Many of these have been published, but many more are preserved in manuscript collections throughout the country.[4] The vast majority of the diaries are chronological records of the overland trip. They vary in usefulness from entries which merely note the distance traveled each day and give a brief comment on the weather to highly observant and detailed commentary on the geography, flora and fauna, and the rigors of life on the trail, including relationships among the travelers and the disease and trauma that were experienced. It has been estimated that the overall mortality rate of those heading west was 6 percent but an accurate figure is very difficult to determine.[5]

The medical and surgical problems of the emigrants were essentially the same on both the northern and the southern routes and did not change radically during the thirty-year period (1834–64) covered by this paper. While water supply was more of a problem on the southwestern trails and a specific disease like Colorado Tick Fever (Mountain Fever) was unique to the northern trail through the Rocky Mountains, except for the cholera years, the diseases, injuries and their treatments did not vary significantly. I have, therefore, presented the diary excerpts without distinguishing among the trails or by date. Most of the diseases and sources of traumatic injury and death were similar to those experienced by settled Americans. The difference, of course, was seen in the frequency of some infectious diseases on the trails and certainly in the amount of trauma such as accidental shootings, crushing under wagon wheels, and drownings occasioned by the circumstances associated with overland travel.

In spite of the similarity of medical problems and therapy over this time

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[3] John D Unruh, *The Plains Across The Overland Emigrants and the Trans-Mississippi West, 1840–1860* (Urbana University of Illinois Press, 1979), p 401

[4] Strong collections of overland diaries are found at the Huntington Library, San Marino, California, the Bancroft Library, University of California, Berkeley, the Oregon Historical Society, Portland, Oregon, the Ayer Collection, Newberry Library, Chicago, and the Coe Collection, the Beinecke Library, Yale University, New Haven, Connecticut. Bibliographies of overland narratives are found in Mattes, *Great Platte River Road*, pp 523–66 and Martin L Heckman, *Overland on the California Trail, 1846–1859 A Bibliography of Manuscript & Printed Travel Narratives* (Glendale, Calif Arthur H Clark, 1984)

[5] Merrill J Mattes, "The Gold Rush mania victims and survivors," *Nebraska Med. J*, 1977, 6 77

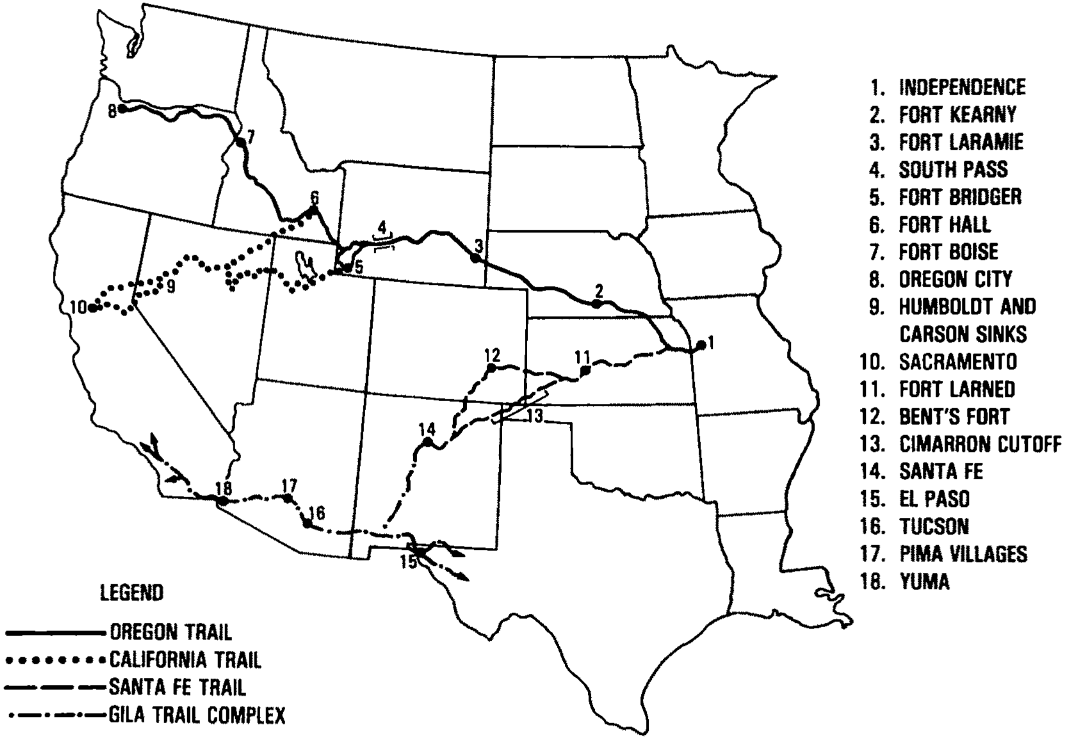

Figure 1. This schematic map demonstrates the primary routes of the major overland trails used by the emigrants from 1840 to 1860. Numerous alternate routes and cutoffs evolved over time. The Oregon and California Trails were the same route as far as Fort Bridger or Fort Hall.

period, one should be aware that the pattern of overland travel was constantly changing. There was no typical year. There was a constant growth of supporting facilities, including development of settlements, entrepreneurs who bridged rivers and built trading posts along the trails, increased federal assistance through establishment of forts, and in later years, protective escorts for wagon trains and the negotiation of Indian treaties.

The most common medical problem was gastrointestinal illness, ranging from chronic bowel complaints to unspecified diarrheas and dysenteries, and diseases such as cholera and typhoid fever. The trail diaries give graphic descriptions:

> Today I've been taken with the diarrhea, common now on the prairie, and have been kept quite busy attending to the wants of nature, having 25 passages today.[6]
>
> In the morning I felt better, in fact well, but after breakfast a diarrhea came on of rather an alarming character, passing much blood, etc It continued until night when I got a little better[7]
>
> .. our mother was taken about two o'clock this morning with a violent diarrhea attended with cramps She, however, aroused no one until daylight when everything was done which we possibly could do to save her life, but her constitution long impaired by disease was unable to withstand the attack . . .[8]
>
> (Sept. 2) Frank gains but slowly. He has suffered from diarrhea for a few days. (Sept. 7) He felt he was decidedly better, has perspired freely during the night and a few evacuations of water with diarrhea that had not returned for sometime previous . . . Had a passage about 3 o'clock and again tonight . . . The laudanum which was given during yesterday afternoon caused these symptoms I should think, and I fear they are not favourable He took some more tonight. (Sept 8) Frank was very weak this morning—had two passages during the night and otherwise rested well[9]
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> Albert has been complaining during the day of headache and other pains—came into camp very sick . during the terrible storm he was writhing with pains in the head, back and bowels, almost screaming with agony under a burning fever and hard pulse—in short a very critical case of some acute fever requiring the best care of a skillful physician and the comfort of civilized life. But instead of that he had neither but was cooped up in a 3½ by 9 box, dependent only upon me for medical aid and I without the skill of a doctor and

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[6] Jesse G Hannon, ed., *The Boston-Newton Company Venture from Massachusetts to California in 1849* (Lincoln University of Nebraska Press, 1969), p 84

[7] H. M. T Powell, *The Santa Fe Trail to California, 1849–1852 The Journal and Drawings of H M T Powell*, ed. Douglas S Watson (1931, New York Sol Lewis, 1981), p 196

[8] Abigail Jane Scott Dunniway, Trail Diary (1852), 25 June 1852, Manuscripts OHS 432 and 432B, Oregon Historical Society, Portland (hereafter OHS) Photocopy of Wyoming-Idaho portion examined at Idaho State Historical Society, Boise

[9] Martha Spence Heywood, *Not By Bread Alone The Journal of Martha Spence Heywood*, ed Juanita Brooks (Salt Lake City Utah Historical Society, 1978), pp 22–24

> very small variety of medicines was forced to take the responsibility. First got down the cathartic—pains increasing during the night gave repeated small doses of morphine—in morning an emetic—today pains gone and much better but no appetite and much nausea.[10]

The most terrifying disease was cholera. Its sudden onset, rapid course, and high mortality rate were fearsome. Cholera's appearance on the trails coincided with its epidemic years in the United States. It was particularly prevalent on the Oregon-California Trail in 1849 and 1850 and on the first third of the trip from the Missouri River to Fort Laramie. Many theories of causation are mentioned in the diaries; including diet, climate, the drinking water, inappropriate clothing, night air, and overindulgence in alcohol.

> David Ayers, one of our company, puked and purged all night and upon examining his condition this morning found he had the cholera, as much so as any case I ever saw. All the symptoms were present even to the rice water discharges I went to work with him faithfully, he lying in his wagon while we were moving on, and now he is very much better, circulation restored, discharges altered, etc. I placed a mustard plaster over his stomach and administered Davis pain killer in large quantities, at the same time making him inhale and perspire large draughts of fresh air, etc.[11]

> I am sitting by the Dr. who has been fast failing for sometime. I begin to fear he will not recover. He has taken opium enough to kill an ox, he has taken two sets of Hawthorns pills and the mischief is he has not had the liquid preparation ... The poor fellow in the adjoining tent groans most piteously to die—would be much relief to him and all his mess. A blister on perhaps 12 hrs. on the Dr.'s stomach will not drain and has just been taken off[12]

Dr. Edward A. Tomkins in 1850 felt that the saline or alkaline ingredients of the water were undoubtedly one of the causes of fatal diarrhea. Accordingly, he insisted that water be boiled each evening for the preparation of coffee or tea in sufficient quantities to fill each individual's canteens for use the next day. Although he felt he was "changing its chemical properties by distillation," he obviously was altering the bacterial content as well.[13]

Others were not so careful. Elisha Perkins recorded the following:

> Once we came to a puddle where rain water had been standing til green on top and so muddy that if their had been a hog about, I should have set it down as one of their wallowing places. Yet this stuff which would have been rejected very suddenly by my stomach at home, I drank with considerable relish by shutting my eyes and holding my breath. This is what is called seeing one of the elephant's tracks.[14]

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[10] Addison M Crane, "Journal of a Trip from Lafayette, Indiana, 1852," 5 August 1852, Manuscript HM 19333, Huntington Library, San Marino, California (hereafter HL)

[11] *Ibid*, 18 May 1852

[12] Charles B Darwin, "Overland Journal, 1849–1850," 15 June 1849, Manuscript HM 16770, HL

[13] Edward A. Tomkins, "Expedition to California, 1850," pp 54–55, Manuscript FAC 222, HL

[14] Elisha D Perkins, "Sketches of a Trip, 1849–1850," 7 June 1849, Manuscript HM 1547, HL

Another overlander, George W. B. Evans, commented "Our drinking water *is living*—that is it is composed of one third green fine moss, one third pollywogs, and one third embryo mosquitoes . . ." In another entry noting the presence of embryo mosquitoes in the drinking water, he commented, ". . . these we strain through our teeth, well satisfied with this good fortune."[15]

Occasionally the drinking water caused transient problems of a different nature. Dr. Wakeman Bryarly was obviously amused when he described the effects of consumption of water from the Hot Springs on the Humboldt Desert:

> The water of the Hot Springs which was used freely by both men and the animals affected them most singularly. Two or three hours after drinking, it produced violent strangling [*sic*] to both. The men in particular were very much annoyed also by the most violent pain in the urinary organs It was truely laughable to see their contortions and twistings after urinating, which they desired to do every hour. The mules also seemed to suffer much, but their symptoms lasted only 10 to 12 hours.[16]

This same water was also credited with causing a mare to abort. On investigation, Bryarly felt that the presence of nitre in the water was responsible for the urinary symptoms and the abortion.

All diarrheal diseases, including cholera, were treated in the same way. An opiate such as laudanum or morphine was administered to alleviate the griping, colicky pain, quiet the bowel, and diminish the frequency of passages. However, this was generally accompanied by calomel, a strong purgative that was administered to the point of salivation and accompanied by capsicum or cayenne pepper as well as camphor. These internal medications were supplemented with externally applied rubefacients, and also sinapisms or mustard plasters to counteract the muscular spasms. An effort was often made to rid the system of calomel once salivation had been achieved by administering another purgative. Other medicaments occasionally mentioned in the treatment of these diseases include burnt brandy, burnt rhubarb and steeped white oak bark.

It is possible that some of the diarrhea experienced on the Oregon-California Trail in the region of the Rocky Mountains may have been caused by the protozoan infection giardiasis, as it is common in that area today. Malaria—known as the ague or intermittent fever—was a common affliction. Quinine was administered for it and also calomel and other medicines to purge the patient and make him vomit. Smallpox, measles, and diphtheria were not uncommon.

When the emigrants reached the Rocky Mountains, particularly on the

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[15] George W B Evans, *Mexican Gold Trail The Journal of a Forty-Niner,* ed. Glen S Dumke (San Marino, Calif Huntington Library, 1945), pp 58, 60

[16] Vincent Geiger and Wakeman Bryarly, *Trail to California The Overland Journal of Vincent Geiger and Wakeman Bryarly,* ed David M. Potter (New Haven Yale University Press, 1945), p 194

Oregon-California Trail, they began to describe a new set of symptoms which included excruciating headaches and severe muscle and joint pains. This complaint was called mountain fever:

> At dawn this morning E. W Summy and Lewis Mitchell applied to me for medications They were severely and suddenly attacked last night after partaking of a hearty supper. Their disease is what the Mormons have termed mountain fever, being a disease peculiar to this region. Many patients complain of a most violent pain in the head and eyes, with dimness of vision, pain in the back and limbs, great lassitude, alternations of chills and fever, nausea and vomiting, constipation. Such are the most prominent symptoms. The pain from this disease is very great! I prescribed for them and this evening they are some easier. I saw a company of nine men today which have been compelled to lay at Green River a week, five of their men having the mountain fever at one time—it is very common at the river. The disease cannot be said to be very dangerous, but it is severe[17]
>
> We have three men too sick to ride and have camped near the Sweetwater River ... McCormick is better but W. D. Mundell and I. Mears are very sick I suppose they have what is called here Mountain Fever It comes on with a sense of weariness and shortness of breath with severe pain in the head, muscles and bones with chills[18]
>
> On Monday last I was taken violently sick with the Mountain Fever. I do not know as I ever experienced such excruciating pain in my life before as I did through Monday night It was mostly in my back and hips.[19]
>
> A great number of men have been taken sick within a few days. The symptoms are violent pain in the head and limbs but generally does not last long until they gradually recover[20]

Initially mountain fever was a "catch-all" term applied to a variety of febrile diseases that happened to develop in the high altitude of the Rocky Mountain area. Eventually, however, a common pattern of symptoms began to be differentiated which separated mountain fever from other non-exanthematous febrile cases. The disease occurred primarily in the spring and early summer with one to three episodes of fever lasting roughly forty-eight hours separated by two to eight days of seeming good health. Pronounced and prolonged chills were characteristic at the onset. Constipation, severe muscle and chest pains particularly in the back and loins and joint pains, headache, and retro-orbital pain were also common symptoms. In 1906, Major Charles F. Kieffer, Medical Corps, U.S.A., conducted careful studies at Fort D. A. Russell, Wyoming, and demonstrated that this febrile illness was transmitted by means of the bites of woodticks. The disease has been known as Colorado Tick Fever since 1926 and more recently has been found to be an arbovirus infection.[21]

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[17] William S McBride, "Journal of an Overland Trip from Goshen, Indiana to Salt Lake City, March 31–June 26, 1850," 18 June 1850, Manuscript HM 16956, HL.

[18] William T Parker, "Notes by the Way. Diary of an Overland Journey from Ohio via Sublette's Cutoff and the Humboldt River, Life in the Mines 1850–1852," 7 June 1850, Manuscript HM 30873, HL

[19] Levi Jackman, Trail Diary (1847), 7 July 1847, Manuscript A1-1, Brigham Young University Library, Provo, Utah (hereafter BYU) Photocopy of Wyoming-Idaho portion examined at Idaho State Historical Society

[20] Charles A. Harper, Trail Diary (1847), 1 July 1847, Manuscript BYU 1007, BYU Photocopy of Wyoming-Idaho portion examined at Idaho State Historical Society

The staples of the typical emigrant diet were bread, bacon, and coffee. A number of travelers made a point of carrying along citric acid, vinegar, pickles, dried fruit and vegetables as antiscorbutics. Others prepared salads from wild fruits and vegetables along the way. Those who neglected to bring antiscorbutics and did not utilize the fresh vegetation might succumb to scurvy in the last third of the trip because of vitamin C deficiency. For example, James D. Lyon in a December 1849 letter from San Francisco published in the *Detroit Advertiser* stated:

> The amount of suffering on the latter part of the route was almost incalculable. No one except those who saw or experienced it, can have any idea of its extent—sights, the thoughts of which, would make the blood chill in any ***human*** breast. After I left the train, I saw men sitting or lying by the roadside, sick with fevers or crippled by scurvy, begging of the passersby to lend them some assistance, but no one could do it. The winter was so near, that it was sure death literally, and the teams were all giving out, so that the thought of hauling them in the wagons was absurd. Nothing could be done, consequently they were left to a slow lingering death in the wilderness.[22]

Charles Gray noted:

> We have met two English gentlemen, one of whom was quite ill and the other a Dr. White of Bath, England about as near drunk as he well could be. He examined the General's legs and ankles, which have lately been so much swollen and decidedly pronounced it *scurvy* He had been assistant surgeon on board the English sloop of war "Juno" and has had much experience in that complaint, although he was quite a young man.[23]

> I was much surprised today with indications of the scurvy, pain in the ankles and legs, sores breaking out on my hands, and bleeding of my gums, when polishing my teeth God grant it may not be for I have suffered enough already, I think.[24]

The periods of prolonged thirst, exposure to alkali dust for days on end, and the mosquito, buffalo gnat, and deer fly bites that often became infected may not have been life threatening, but they were hardships that caused medical problems.

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[21] Noxon Toomey, "Mountain fever and spotted fever of the Rocky Mountains," *Ann. Int Med*, 1931, *5* 585 and Wilbur G Downs, "Arboviruses," chap 4 in Alfred S Evans, ed, *Viral Infections of Humans* (New York Plenum Medical Book Co, 1976)

[22] James D Lyon quoted in J Goldsborough Bruff, *Gold Rush The Journals, Drawings, and Other Papers of J Goldsborough Bruff*, ed. Georgia W Read and Ruth Gaines, 2 vols (New York. Columbia University Press, 1944), 1: 611, critical note 172

[23] Charles Glass Gray, *Off at Sunrise The Overland Journal of Charles Glass Gray*, ed. Thomas D Clark (San Marino, Calif Huntington Library, 1976), p 136

[24] *Ibid*, p 153

> . . . Laubenheimer, Teats, Parker and myself were suffering all the torments of burning thirst . by this time I had become very much exhausted, my mouth and tongue parched and much swollen . . . we found George S McNight four miles from the water, raving mad, burning with fever . . . I have now seen trouble, I have seen insanity produced by thirst and never do I wish to see so much suffering again . . . Another circumstance connected with the sufferings of some of the men must be mentioned here, because the remedy adopted by them went far to relieve them of thirst and strengthened their failing bodies, and may be of vast service to such persons as may be equally unfortunate. The remedy adopted was drinking their own urine, and one man actually drank that of a horse[25]

> There is so much of the nature of alkali in the dust that is raised by the wind that our faces are so very much inflamed and reddened that it is painful.[26]

> It [sand] was nearly up to the hub of our wagons in many places and we are almost blinded by the dust from it This dust is very bad on the eyes causing soreness and inflammation . . Never saw such dust! In some places it was actually to the top of the forewheels! Fine white dust, more like flour. Our men were a perfect fright, being literally covered with it Our poor animals staggered along through the blinding dust, coughing at every step! . It is very cold in the mountains, a fresh breeze is blowing all of the time, and the dust . how can I give any idea of it? We are almost blinded by it. My eyes are very sore We all have to wear veils or goggles, some wear handkerchiefs over their faces and with all we are almost choked and blinded It trys my patience more than anything else![27]

Dr. Israel S. P. Lord, in commenting on the disappearance of mosquitoes west of Fort Laramie, wrote in his diary, "They are very great pests, and have caused me, at least more trouble and suffering than everything beside since we left the river. Hunger, thirst, cholera, cold or heat may be endured or cured—mosquitoes never: and the only remedy I can prescribe is 'put for the Black hills.' "[28]

Many diaries contain comments on the prevalence of mosquitoes in the vicinity of Fort Hall in southeastern Idaho.

> The mosquitoes bite me so that I cannot write . . . The mosquitoes drive us out this morning and we yoked up before daylight and drove on . . . The mosquitoes

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[25] Evans, *Mexican Gold Trail*, pp 65–67

[26] Silas Newcomb, "Journal of an Overland Trip to California and Oregon, 1850–51," 22 June 1850, Manuscript FAC 4, HL

[27] Eleanor Allen, *Canvas Caravans* (Portland, Oregon Binfords and Mort, 1946), pp 43, 57, and 79

[28] Israel S P Lord, "Journal of the Overland Trip to California by way of the Oregon Trail; Life in the Mines, Return Journey by way of the Isthmus of Panama 1849–1851," 1 July 1849, Manuscript HM 19408, HL

> are troublesome beyond anything I have ever conceived There are clouds of them and they are very ravenous. Smoke is no protection[29]

> . . . where we encamped is the headquarters of the mosquitoes. None can conceive of the annoyance of these devils incarnate until they have experienced what we did at this camp. Our animals were very near stampeding from them and our guards were so busy saving their own eyes that it was almost impossible for them to watch the animals.[30]

> There is a species of very minute black gnats commonly known as the buffalo gnat which are exceedingly annoying. Their bites are very poisonous producing great swelling of the hands and face . on some persons the bites of these little insects produced an inflammation resembling erysipelas—on some the eyes were almost swelled shut. It was common to see emigrants with their faces closely muffled in their thick silk handkerchiefs and their hands covered with thick gloves whilst others preferring air and light, *greased their hands and faces all over with bacon grease.*[31]

Other medical problems mentioned at least once in the diaries examined include death in childbirth and infant death, rape, tuberculosis, insanity, cancer, laudanum overdose, rattlesnake bites, bronchitis, neuralgia, rheumatism, brain congestion, intestinal worms, boils, fever blister, blistered feet, felon, severe sunburn, head colds, headache, toothache and earache.

Traumatic injury, often fatal, was not uncommon on the overland trails. The most common traumatic accident was death or injury from being crushed under the wagon wheels. Children and adults would fall beneath the moving wheels in stepping down from the wagons in motion. One of the most vivid descriptions of the aftermath of such an accident is given by Edwin Bryant.

> A boy eight or nine years of age had had his leg crushed by falling from the tongue of a wagon and being run over by its wheels . . . After a most fatiguing and exhausting ride we reached the encampment . When I reached the tent of the unfortunate family to which the boy belonged, I found him stretched out upon a bench made of plank ready for the operation which they expected I would perform. I soon learned that the accident occasioning the fracture had occurred nine days previously That a person professing to be a "doctor," had wrapped some linen loosely about the leg and made a sort of trough, or plank box, in which it had been confined In this condition the child had remained without any dressing of his wounded limb, until last night, when he called to his mother . . . that he could *feel worms crawling in his leg!* . . . An examination of the wound for the first time was made, and it was discovered that gangrene had taken place, and the limb of the child was swarming with maggots! I made an examination . . The limb had been badly fractured, and had never

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[29] Joseph W Wood, "Diary of an Expedition to California via Sublette Cut Off, Fort Hall, and Truckee River, Life in the Mines 1849–53," 20 and 21 July 1849, Manuscript HM 318, HL.

[30] Geiger and Bryarly, *Trail to California*, p 155

[31] McBride, "Trip from Goshen," 1 June 1850

> been bandaged; and from neglect gangrene had supervened, the child's leg from his foot to his knee was in a state of putrefication.[32]

Bryant realized that the youth would not live for twenty-four hours, much less survive an operation, and refused to amputate the limb. Another member of the emigrating party stated he "had formerly been an assistant to a surgeon in some hospital" and would perform the surgery if desired by the family. Bryant then watched the preparations made "for the butchering of the little boy."

> The instruments to be used were a common butcher knife, a carpenter's handsaw, and a shoemaker's awl to take up the arteries The man commenced by gashing the flesh to the bone around the calf of the leg ... He then made an incision just below the knee and commenced sawing; but before he had completed the amputation of the bone, he concluded that the operation should be performed above the knee. During these demonstrations the boy never uttered a groan or a complaint, but I saw . that he was dying. The operator, without noticing this, proceeded to sever the leg above the knee. A cord was drawn around the limb so tight that it cut through the skin into the flesh The knife and saw were then applied and the limb amputated. A few drops of blood only oozed from the stump, the child was dead—his miseries were over![33]

Other references to such accidents were very brief and to the point.

> A child fell from one of the wagons and it ran over his breast and one arm, but the ground being soft underneath the wheel, he was not killed though taken up senseless.[34]

> We stopped our teams for those who were ahead of us as Joseph was in the act of jumping out of the wagon. He fell down in front of the forward wheel and it grazed his hip and run over his arm between the elbow and his shoulder. It broke his arm short off. We set it to the best of our ability[35]

> A child about three years old .. while in the act of taking it out of the wagon, was let fall and both wagon wheels passed over its body It died in about eight hours.[36]

> Today we were overtaken by the Allen and Turners Pioneer Train . They had lost two men. One had fallen out of the wagon, been run over, and killed instantly . [37]

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[32] Edwin Bryant, *What I Saw in California, being the Journal of a Tour in the Years 1846, 1847* (New York· D. Appleton, 1848), pp. 86–88

[33] *Ibid*, p 89

[34] James Field, Trail Diary (1845), 27 May 1845, Manuscript OHS 520, OHS Photocopy of Wyoming-Idaho portion examined at Idaho State Historical Society

[35] Joseph Grafton Hovey, Trail Diary (1848), 20 September 1848, Manuscript SC 215, BYU Photocopy of Wyoming-Idaho portion examined at Idaho State Historical Society

[36] Ruben Miller, Trail Diary (1849), 29 August 1949, Manuscript MSd 1392, fd 2, Historical Dept., Church of Jesus Christ of the Latter-Day Saints, Salt Lake City, Utah (hereafter LDS Church) Photocopy of Wyoming-Idaho portion examined at Idaho State Historical Society

[37] James Mason Hutchings, *Seeking the Elephant, 1849 James Mason Hutchings' Journal of his Trek Overland to California* , ed Shirley Sargent (Glendale, Calif Arthur H Clark, 1980), p 142

The next most frequent cause of traumatic injury and death was accidental discharge of firearms. The emigrants were heavily armed with rifles, shotguns, and revolvers both to shoot wild game and because they thought that they needed firearms to protect themselves from the Indians. Many of the weapons were of poor quality and lacked safety mechanisms. Warnings to keep the firearms unloaded were generally ignored, thus careless handling and stowing in the wagons resulted in many serious injuries and deaths:

> Among those guarding was Mr. James Davison from Frederick County, Virginia. He had a double barrel shotgun in his hand which he had taken out for the purpose of killing some game for the Captain He was lying upon the grass, and upon rising, the cock of his gun caught in a bush and went off sending the contents, which was small shot and a few buckshot, into the abdomen (the right iliac region). It glanced to the right, fracturing the hip bone and leaving the load just under the skin, some few of the shot passing through. I was in camp at the time and immediately after the report of the gun, was heard the cries, "I'm, I'm shot." Upon [our] looking he was seen to run a few yards and fall. I ran to him as quick as possible and found several inches of intestine protruding. I replaced it as soon as possible and upon examining the wound found it as described· one inch of the parietes of the abdomen was carried away, making it very difficult to keep the intestine in its proper place. He was layed in a blanket and carried into camp where I made a more thorough examination and dressed the wound accordingly . he departed this life after suffering the most acute agony for twelve hours.[38]

> Levi Fredenberg, one of the teamsters . . had carelessly thrown his rifle into the wagon without taking off the cap, and as he was descending the steepest ravine the rifle slid out the front of his wagon and bouncing on the tongue startled him. He snatched and caught it up quickly, the cock caught, and the ball struck above his left eye, taking away the skull to the ear.[39]

> Bovee's death was accidental and was a very sad affair. When he and another man were hunting wolves in the bluffs about two miles from the train, Bovee shot one. The wolf fell down a crevice between the rocks. When Bovee stooped to scalp the animal, his revolver fell from the holster hitting a rock and shooting him through the heart. He lived only two minutes He leaves a wife and two children [40]

The third most frequent cause of traumatic injury or death was stampeding livestock.

> Traveled six miles to the grave of Sister Hawkes who was killed by a stampede of the teams in advance of us [41]

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[38] Geiger and Bryarly, *Trail to California*, pp 183, 184

[39] Hutchings, *Seeking the Elephant*, p 114

[40] Hamilton Scott, "Trail Diary (1862) with additional notes by Alvin Zaring, a member of the party," 4 July 1862, manuscript in vertical file, Idaho State Historical Society

[41] Silas Richards, "Trail Diary (1846)," 22 August 1846, Manuscript MSd 5030, LDS Church Photocopy of Wyoming-Idaho portion examined at Idaho State Historical Society

> A company is encamped near us who had lost 30 head of oxen by a stampede—the cattle like to have overrun a man and killed him. It was with difficulty that several of the guards made their escape.[42]

> Between eleven and twelve o'clock our cattle scared at some loose horses belonging to another train. About twenty five teams ran away upsetting and breaking wagons, running over men, women and children. Mrs. Townsend from Monroe, Iowa was dangerously wounded. Wilson Scott had a broken leg. Mrs Hoover's head was bruised . Thomas Paul's child died last night and Mrs Townsend who was so seriously hurt in the stampede died about twelve o'clock today.[43]

Death from drowning was a hazard at the numerous river fords. In attempting to swim the livestock across, emigrants often got entangled with their animals and were pulled under by strong currents.

> A man was drowned here yesterday and just above (12 miles) seven men have been drowned in two days while rafting over their wagons[44]

> Two men had, during the day, been drowned in the Platte in swimming across the river .. We learned today that some teamsters had found and buried the body of a man drowned in the river, probably at the ferry above.[45]

> Stream rapid and difficult to ferry; several men drowned at one place by the upsetting of a raft in the currents and five more in attempting to ride and drive over a lot of horses and mules.[46]

> In passing up the stream to view the scene (Devil's Gate), I found a man just drowned in the stream, from Galena, named Fanson.[47]

Another common cause of traumatic injury and death on the trail was the attacks of the emigrants upon each other, often due to attempted theft or the unleashed antagonism caused by small personal differences greatly magnified by the strain of overland travel. Frontier justice was usually rapid.

> Another serious quarrel in our mess today, originating out of the most trifling accident. The Englishman and C. P.—fought at first with their whips then they took the butt ends After some severe blows were struck .. they resorted to pistols, but the captain coming up prevented loss of life, tho' each threatens the life of the other before they reach California.[48]

> Gave prisoner [he had killed another emigrant] his choice to be shot or hanged. He preferred to be shot. Twenty five armed men marched him one and one

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[42] Wood, "Diary of an Expedition," 22 May 1849

[43] Scott, "Trail Diary (1862)," 2 and 3 August 1862

[44] Wood, "Diary of an Expedition," 21 June 1849

[45] Newcomb, "Journal of an Overland Trip," 13 and 14 June 1850

[46] Isaac Foster, "Journal . 1849–50," 22 June 1849, Manuscript HM 16995, HL

[47] *Ibid*, 28 June 1849

[48] James F Wilkins, "Journal . 1849," 4 July 1849, Manuscript HM 27511, HL

> half miles to where his grave had been prepared. Fourteen of the guns were loaded with bullets and the rest were blanks When the signal was given they all fired, the prisoner falling backwards and dying within one minute[49]

> Two men who joined us a few days since had a violent quarrel in camp this evening. Blows were exchanged, knives and pistols drawn .. [50]

> A serious encounter has just taken place in our camp between a Mr. James and a Mr. Parker, strangers to us They had a misunderstanding and came to blows, and before many minutes, Parker fell mortally wounded, his right side cut open and his intestines gushing from the large gashes in his abdomen. In three minutes after his fall, the last breath passed the opening in his side as he lay there a monument of human folly and wickedness when unrestrained by law and social contact. James received a large gash in the left side close under the arm, the knife having cut through the ribs and penetrated the lungs. The surgeons in our company pronounced his case hopeless and in a week or perhaps ten days he too will pass to the silent tomb [51]

The extent of Indian attacks on overland travelers has been greatly exaggerated. It is true that nearly 400 emigrants were killed by Indians in the first twenty years of overland travel, and that Indian begging and thievery were continuing nuisances. On the other hand, many tribes provided travelers with information, foodstuffs, clothing, equipment, horses, and canoeing and swimming skills.[52] Nevertheless, on those occasions when a violent encounter did take place, there was certain to be a lengthy diary entry.

Other trauma cited in the diaries included deaths by lightning, gunpowder explosion, suicide, probable subdural hematoma, and fractures and dislocations from overturned wagons or kicking livestock. Maiming by a wounded grizzly bear was cited in two trail diaries, and at least one individual was gored by a wounded buffalo.

The emigrants were usually dependent on themselves for medical care, although a number of wagon trains included a physician, particularly at the time of the gold rush. The majority of travelers relied on home remedies, patent medicines, and domestic medicine texts such as those written by William Buchan and John C. Gunn.[53] It was common for those groups traveling without a physician to try to keep in reasonable proximity to a wagon train that included one. Well organized groups or companies when forming at their place of origin in the East or middle West would offer a variety of enticements to encourage physicians to join their parties. Practitioners were generally excused from standing watch or taking turns at the more menial tasks of the daily operation.

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[49] Scott, "Trail Diary (1862)," 8 July 1862

[50] Bryant, *What I Saw in California* . . , p. 71

[51] Evans, *Mexican Gold Trail*, p 126

[52] Unruh, *The Plains Across*, p 386

[53] William Buchan, *Domestic Medicine* (New York: Scott, 1815), John C Gunn, *Domestic Medicine or the Poor Man's Friend*, 9th ed (Xenia, Ohio· Purdy, 1837)

By most accounts, physicians on the overland trails were quite generous with their time, even when overworked. They were frequently summoned to care for patients at some distance ahead of or behind their own wagon train. The diarists tended to note the exceptions such as Dr. E. C. Park, who died of cholera on the trail, and was described by a fellow traveler as a trifling fellow so addicted to opium that he was of little help to his companions, and a Dr. Burchard, a member of the same company from Greenville, Illinois, who was described as a coarse bully, an evil-tempered man and an infidel.[54] Another physician, Dr. J. Noble, irritated one diarist by painting his name on grave markers along the trail. He also displeased another overlander who wrote beneath Noble's name on one of the signs "is a Jackass."[55] On another occasion a diarist commented that the cause for the disbanding of a company from Ohio was "too many doctors and lawyers."[56]

Eight of the diaries examined in this study were written by physicians. Of the eight, six were allopaths, one was an eclectic, and one was a homeopath. With one exception, they were all headed for the gold fields of California.

One of the more informative diaries was that of homeopathist Israel S. P. Lord who missed no opportunity to cast aspersions on the allopaths:

> Saw a grave today which had been dug open and a medicine chest taken out Some doctor, all forlorn, jaded, discouraged, disconsolate and worn, coat in rags and breeches torn, oxen, horses, mules stolen dead or gone, in a fit of desperation "cached" his medicines and like the famous Capt. Kid [*sic*] sought to protect them by an appeal to popular superstition in the shape of a headstone and the spirits of men who walk at midnight. It was no go Some wicked scamp has raised the dead and the Doct. will seek in vain when he returns After all it is no great loss to the world, and to bury was the best use that could be made of them Better exhume and destroy medicines than that they should destroy and inhume men. Better bury medicine in a chest than in a patient, and the more you do of the first the less you will be asked to do of the last.[57]

Botanical medicine was practiced by the Mormons and at least one hydropathist was wrapping her patients in wet sheets while they traversed the trail.[58]

Alonzo Delano's 1854 classic of frontier literature, *Life on the Plains and Among the Diggings,* contains a fascinating interchange between a Thomsonian and an allopath suffering from cholera. The allopath is relating the story to Delano:

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[54] Powell, *The Santa Fe Trail,* in unpaginated new foreword.

[55] Helen Carpenter, "A Trip Across the Plains in an Ox Wagon, 1857" in Sandra L. Myres, ed, *Ho for California! Women's Overland Diaries from the Huntington Library* (San Marino Huntington Library, 1980), p 125

[56] Peter Decker, *The Diaries of Peter Decker—Overland to California in 1849 and Life in the Mines, 1850–51,* ed Helen S Griffen (Georgetown, Calif. Talisman Press, 1966), p 91

[57] Lord, "Trip to California," 13 October 1849

[58] Charlotte Emily Stearns Pengra, *Diary of Mrs Bynon J Pengra, 1853* (Eugene, Oregon. Pioneer Historical Society, 1966), pp 33–46.

> Why, I was taken with the cholera, and came within an ace of slipping my wind. I was taken suddenly, and most severely, and there was not a man near me who understood dealing out a dose of medicine, except one cursed fool of a pepper doctor I was vomiting, purging, and suffering all the tortures of the infernal regions, when I told the steam doctor to give me a large dose of calomel, camphor and opium, nor stop to count the grains, either. But he urged me to take a dose of number-six, "Go to the—with your number-six—give me calomel, quick, or I am a dead man." But the fool kept talking about number-six—number-six, till, finally, to satisfy him, and while I was writhing in agony, I told him to pour it out—hoping that after taking ***his*** medicine, he would be willing to give me mine. He immediate poured out a double dose of his ***liquid fire,*** and I took it down. I thought I should surely die, for the remedy seemed worse than the disease. I thought my whole insides were on fire, and I roared out "water, water! for heaven's sake, or I shall be burnt up" But there was not a drop of water in the camp, nor any within a mile 'Well then, give me brandy—anything: fire, turpentine, live coals; I am dying!' All were very much alarmed, and the doctor jumped to the brandy jug, and poured out half a glassfull, which I nearly swallowed before I discovered the wretch had made a mistake in the jugs, and had given me another quadruple dose of number-six—thus adding fuel to the flame, and now I thought I was surely gone. But it stuck. It stopped my vomiting in a short time, and then he was willing to give me my medicine, and that stuck too; and operated finely. The disease was checked, and I got well; and after all, I don't know but the fellow's number-six was beneficial to me.[59]

Another source of medical care on the Oregon-California Trail was the military posts such as Fort Kearny and Fort Laramie. Sick emigrants were often abandoned along the trail and had to be brought in by the soldiers; others were left at the posts without means or friends to care for them. In 1852 the drain on medical personnel and supplies at frontier garrisons was sufficient to warrant a comment in the Surgeon-General's annual report.[60]

> We found a mile from camp a man left by another party. He was deranged and sick with a very bad diarrhea. Our Dr. gave him some medicine and something to eat, but could not get him into camp He is entirely naked and sunburned. A pitiable object. We shall take some measures to get him to the Fort [Laramie]. The party that left him are very censurable, hardly human.[61]

It has been estimated that the overall mortality rate on the Oregon-California Trail was 4 to 6 percent of those starting west. Burial practices varied. Early in the trip an effort was made to build a coffin and to hold a fairly formal burial service. However, as time and distance increased, there was little wood for coffins and less inclination to build them. Bodies would be buried wrapped in a blanket, ideally at a depth sufficiently deep to discourage marauding animals:

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[59] Alonzo Delano, *Life on the Plains and among the Diggings* (Auburn and Buffalo, N Y Miller, Orton, & Mulligan, 1854), Readex Microprint facsimile edition, 1966, pp 263–64

[60] U S War Department, *Annual Report of the Secretary of War* (Washington, 1852), pp 136–37

[61] Hannon, ed., *The Boston-Newton Company,* p 129

> . . . the grave is duly wide at the top with several shelves of earth as we pass down. The bottom is formed in the shape of a coffin and a board above and below the body clothed in befitting garments formed its only protection from the damp earth—while above the graves are generally piled rocks to save them from the ravaging wolves which inhabit these mountains[62]
>
> Persons dying on these plains are buried without coffins wrapped in their blankets, and when possible a wooden head board is erected. The top of the grave is filled in with stone when they can be got to keep the wolves from digging out the corpse—and when this cannot be done, the grave is quite often dug open.[63]

Unfortunately, however, shallow graves were too often the norm:

> We came to the summit of the Humboldt Mountains on the 21st of August. On ascending to the summit, I went into a hollow to the right and here found a grave torn open by the wolves, and a person's legs sticking out to the hips with all the flesh gnawed off to the ankle joints, the feet remaining whole on the surface of the ground. I regarded this as rather an unpleasant sight and quit the scene and joined the train shortly thereafter[64]
>
> We saw several places where the dead had been dug up by the wolves, which had picked from the bones what flesh the pestilence had left. Here and there lay a skull lost from the frame to which it belonged Out of some graves a hand or a foot would project.[65]

Although a number of the emigrants made the cross-country trip in good health, these quotations from a sampling of the diaries provide ample evidence of the varied medical problems facing all the overlanders. Even today, if one makes the effort to follow portions of the overland trails in isolated and undeveloped areas, the presence of emigrant graves, swarming deer flies and mosquitoes, and choking dust serve as a reminder of some of the problems faced by the emigrants. As one reads the names and dates of passages of the thousands of emigrants who cut and scratched their record on Independence Rock and other register or name rocks, and recalls the diary accounts of their fellow overlanders, one is quite certain that many had "tred" the elephant's tail.

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[62] Bartlett Tripp, Trail Diary (1861), 27 September 1864, Manuscript HDC MSd 4210, LDS Church. Photocopy of Wyoming-Idaho portion examined at the Idaho State Historical Society

[63] Crane, "Trip from Lafayette," 16 June 1852

[64] T. J. Able, Letter to parents, 12 October 1857, Manuscript HM 16763, HL

[65] Mary Minerva Dart Judd, "Two Utah pioneers," *Our Pioneer Heritage*, 1964, 7 284

RICHARD SHRYOCK MEDAL ESSAY

THE SELECTIVE TRANSPORT OF MEDICAL KNOWLEDGE: ANTEBELLUM AMERICAN PHYSICIANS AND PARISIAN MEDICAL THERAPEUTICS*

John Harley Warner

The years from 1820 to 1860 have aptly been identified as the French period in American medicine.[1] During these four decades, literally hundreds of American physicians, among them many who became the leaders of the profession in America, travelled to the Paris hospitals to supplement the medical training they had received at home. Historians have recognized that the knowledge and technique they brought back were leading components in the transformation of American medicine.[2] Yet the transferal of Parisian medicine to America has more often been described than explained—more often seen as an inevitable consequence of American physicians' studies in Paris than as the expression of choices and purposeful actions that must be accounted for. The truth value and utility of French knowledge and technique in pathological anatomy, clinical diagnosis, and surgery have commonly been regarded as sufficient explanations not only for why Americans were attracted to Paris in the first place, but also for the passage of medical knowledge in these areas to America. Such an interpretation entails a tacit model of the dissemination of knowledge as being passive and uniform, while in fact the process is both dynamic and selective.[3]

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[1] Richard Harrison Shryock did much of the early historical exploration of French medicine's influence in America; see Shryock, *American Medical Research, Past and Present* (New York. The Commonwealth Fund, 1947), pp 21–36, "The Influence of French Medicine in Europe and America," in *idem, The Development of Modern Medicine An Interpretation of the Social and Scientific Factors Involved* (1936, rpt. Madison· University of Wisconsin, 1979), pp 170–91, and "The Advent of Modern Medicine in Philadelphia, 1800–1850," in *idem, Medicine in America Historical Essays* (Baltimore and London The Johns Hopkins Press, 1966), pp 203–32

[2] Of an extensive literature on American physicians and the Paris clinical school, the most useful studies, in addition to those cited in note 1, include Henry Blumenthal, *American and French Culture, 1800-1900 Interchanges in Art, Science, Literature, and Society* (Baton Rouge Louisiana State University Press, 1975), pp 402–67, Pierre Huard and Mirko D Grmek, "Les élèves étrangers de Laennec," *Rev d'hist sciences*, 1973, *26* 315–37, Russell M Jones, "American doctors and the Parisian medical world, 1830–1840," *Bull Hist Med*, 1973, *47* 40–65, 177–204, *idem*, "American doctors in Paris, 1820–1861: a statistical profile," *J Hist Med*, 1970, *25* 142–57; *idem*, "An American medical student in Paris, 1831–1833," *Harvard Libr. Bull*, 1967, *15* 59–81, and *idem*, "Introduction," in *The Parisian Education of an American Surgeon. Letters of Jonathan Mason Warren (1832–1835)* (Philadelphia: American Philosophical Society, 1978), pp 1–69 Russell C Maulitz's "Channel crossing the lure of French pathology for English medical students, 1816–1836," *Bull Hist Med*, 1982, *55* 475–96, though restricted to the English context, is an exceptionally useful analysis of some of the motivations that led physicians to study in Paris

American physicians were highly selective about which aspects of Parisian medicine they transmitted to America and which ones they eschewed. Their judgments on what constituted medical models worth emulating were not always the same as those of their French mentors, nor were they identical with those of Austrian or English physicians studying in Paris.[4] Cultural values and needs, which shaped physicians' decisions as to which aspects of French medicine they would pay attention to, were just as important as the inherent worth of particular medical ideas and practices in determining the success or failure of their dissemination.

No branch of French medicine was exported to America whole and unaltered. But the cardinal role selection played in determining what was transmitted is nowhere more vividly displayed than in the case of medical therapeutics. I wish to suggest that on the whole Americans shunned French ideas about medical therapeutic *practice*, seeing them as probably irrelevant and perhaps dangerous in the American context. In contrast, they energetically embraced French medical therapeutic *epistemology*, and regarded it as among the Paris clinical school's most important messages for American medicine. They actively sought to apply it to the reform of medicine in America. I will argue that this selective transport of French medical therapeutics reflected choices that were informed by prevailing medical theory, by the moral and professional values of American physicians, and by what they perceived as the social and intellectual needs of the profession in their country. The dissemination or the stasis of knowledge, as this selectivity in the transfer of French therapeutics to America illustrates, was dependent upon the cultural appraisals made of that knowledge by its potential couriers.[5]

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[3] Recent studies in the historical sociology of scientific knowledge have particularly emphasized the ways social and cultural interests and political motivations shape the diffusion or stasis of scientific ideas Especially helpful have been Steven Shapin's " 'Nibbling at the Teats of Science' Edinburgh and the Diffusion of Science in the 1830s," in Ian Inkster and Jack Morrell, eds, *Metropolis and Province Science in British Culture, 1780–1850* (Philadelphia: University of Pennsylvania Press, 1983), pp 151–78, and his "Social Uses of Science," in G S Rousseau and Roy Porter, eds, *The Ferment of Knowledge Studies in the Historiography of Eighteenth-Century Science* (Cambridge Cambridge University Press, 1980), pp 93–139 A useful review of historical studies on the dissemination of scientific knowledge is R G A. Dolby, "The transmission of science," *Hist Sci*, 1977 *15* 1–43

[4] See Walter Artelt, "Louis' amerikanische Schuler und die Krise der Therapie," *Sudhoffs Arch*, 1958, *42* 291–301 The present essay is one step toward a comparative study of the medical profession in early and mid-nineteenth-century Britain and the United States centered upon attitudes toward French medicine

[5] Therapeutics refers herein to medical therapeutics, not to such topics as the mechanical aspects of surgical, dental, or obstetrical therapeutics This essay is principally concerned with that part of the process of transmission at which a choice was made either to transport something or to let it be. It does not concentrate on how physicians became aware of French medicine in the first place, on the way knowledge was moved from one environment to another, or on how knowledge was applied and transformed within that new

Between the 1820s and the Civil War, the ideal of cultural independence, which had been so central for some of Jefferson's generation, remained strong. Americans continued to look to Europe for cultural instruction, but at the same time there was much in foreign models that disturbed them. Their uneasiness went beyond simple nativist resentment of cultural colonialism. Respect for European learning was tempered by disdain for Old World corruption, while enthusiasm for European knowledge was counterbalanced by pride in Americans' putative superiority in putting knowledge into practice. European sophistication and luxury were alluring, but so too were America's imagined innocence and simplicity. Even envy of European institutions was balanced against the appeal of more functional American ones less hampered by the burdens of ancient tradition. Underlying Americans' ambivalence was suspicion of the Old World, the sense that while it had something to offer them, its procedures were not those of their own country, nor should they be. These often conflicting sentiments colored the ways Americans perceived Europe and the ways Americans travelling there interpreted their own experiences. More than this, such tensions fundamentally shaped the transmission of European culture to America. Americans were hardly likely to transplant willingly aspects of the Old World's culture which startled, threatened, or repelled their sensibilities. Yet Americans also saw in European culture resources they admired, and which they could sometimes put to peculiarly American uses. The dissemination of culture from the Old World to the New was, accordingly, a very selective process.[6]

It is within this context of Americans' ambivalence to European culture that the selective transmission of Parisian medical therapeutics is best understood. Medical therapeutic practice was at the core of the professional role of antebellum American physicians, and had they simply sought in Paris what they saw as being most important to the practitioner in America, medical therapeutics undoubtedly would have been the center of their attention.[7] It

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context. In a study of the Paris clinical school's ultimate influence on American thought and practice, epistemology would properly play a central role and therapeutic precept only a minor one, but critical too would be transmitted knowledge about, for example, the natural history of diseases Some Americans were undoubtedly influenced by the example of French practice even though they found it unacceptable, on the nonconscious use of knowledge in decision-making, see Carol H Weiss, "Knowledge creep and decision accretion," *Knowledge Creation, Diffusion, Utilization*, 1980, *1*. 381–404 Further, American lack of interest in Parisian therapeutic practices was not absolute, as the active Broussaisism of some Americans in the 1820s and 1830s plainly illustrates

[6] Especially on American attitudes toward France, see Blumenthal, *American and French Culture*, Bruce Sinclair, "Americans Abroad Science and Cultural Nationalism in the Early Nineteenth Century," in Nathan Reingold, ed., *The Sciences in the American Context New Perspectives* (Washington, D C Smithsonian Institution Press, 1979), pp 35–53, Howard Mumford Jones, *America and French Culture, 1750–1848* (Chapel Hill University of North Carolina Press, 1927), Ronald L. Numbers and John Harley Warner, "The Maturation of American Medical Science," in Nathan Reingold and Marc Rothenberg, eds , *Scientific Colonialism, 1800–1930 A Cross-Cultural Comparison* (Washington, D.C.: Smithsonian Institution Press, forthcoming), and Elizabeth Brett White, *American Opinion of France From Lafayette to Poincaré* (New York: Alfred A. Knopf, 1927) There is no study of American physicians' or scientists' ambivalent attitudes toward the Old World, cast in the context of the relationship between values and culture, that has the richness of Neil Harris's analysis of *The Artist in American Society The Formative Years, 1790–1860* (New York. George Braziller, 1966)

[7] On the centrality of practice to professional identity in antebellum American medicine, see Barbara G.

decidedly was not. Of all the categories of medical knowledge that mattered to practitioners, knowledge about therapeutic practice was the one that was strikingly and consistently missing from American physicians' descriptions of what they expected to gain or had already gained from study in Paris. But more than negative evidence indicates their pessimism about profiting from French therapeutic practice. American physicians writing home from Paris routinely contrasted their enthusiasm for French pathology, diagnosis, and surgical technique with their apathy or disdain for Parisian medical therapeutics.[8] The Americans' posture can in some small measure be attributed to the French disinclination for therapeutic activism. But the American attitude can not be merely explained away as a consequence of French lack of interest in therapeutics, for Paris clinicians' ardent assaults upon earlier therapeutic approaches clearly showed that they deemed therapeutic reform a worthy project to undertake. Many American physicians deplored French therapeutic practice, and perceived in French therapeutic precept a source of real danger. Why, given their high esteem for some branches of French medical science and the importance accorded medical therapeutics in America, did American physicians regard Parisian therapeutic knowledge as irrelevant, suspect, and even threatening?

In part, American physicians' distrust of French therapeutic knowledge was a natural corollary to their acceptance of the principle of specificity. This was the notion, firmly established in antebellum therapeutic thought, that treatment had to be individually fitted to such specific characteristics of the patient as symptoms, age, gender, ethnicity, moral status, and occupation, and to such characteristics of the social and physical environments as climate, topography, and population density. Treatment was specifically matched not to diseases, but to patients and environments. This belief in specificity meant that native born and immigrant, White and Black, private and hospital patient,

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Rosenkrantz, "The Search for Professional Order in 19th Century American Medicine," *Proceedings of the 14th International Congress on the History of Science* (Tokyo Science Council of Japan, 1975), no 4, pp 113–24, and John Harley Warner, " 'The nature-trusting heresy' American physicians and the concept of the healing power of nature in the 1850's and 1860's," *Perspectives Amer Hist*, 1977–78, *11* 291–324

[8] These observations are based upon my reading of the published and manuscript writings of French-trained American physicians Among the most revealing of the materials I have used in forming these generalizations have been the letters Americans studying in Paris wrote home, especially those of the following physicians Elisha Bartlett (Manuscripts and Archives, Sterling Memorial Library, Yale University, New Haven, Conn), John Young Bassett (Maps and Manuscripts Division, State of Alabama Department of Archives and History, Montgomery), Robert Battey (Special Collections, Robert W Woodruff Library for Advanced Studies, Emory University, Atlanta, Georgia), Henry Ingersoll Bowditch, Oliver Wendell Holmes, George Cheyne Shattuck, Jr , and John Collins Warren (Massachusetts Historical Society, Boston), Henry Ingersoll Bowditch, James Jackson, Jr., Abel Lawrence Peirson, and Henry Willard Williams (Francis A. Countway Library of Medicine, Boston), James Lawrence Cabell (Manuscripts Department, Alderman Library, University of Virginia, Charlottesville), Cornelius George Comegys (in Matthew Scott Cook Papers, Western Reserve Historical Society, Cleveland, Ohio), Charles Thomas Jackson (Manuscript Division, Library of Congress, Washington, D C.), Edward B Jenkins (in John Jenkins Papers, Manuscripts Division, South Caroliniana Library, University of South Carolina, Columbia), Robert Peter (in the Catherine (Peter) and Howard Evans Papers, Special Collections and Archives, Margaret I King Library, University of Kentucky, Lexington), Joseph Webb (in Rutherford B Hayes Papers, Rutherford B Hayes Library, Fremont, Ohio), and Samuel Wigglesworth (Malloch Rare Book and History of Medicine Room, Library, New York Academy of Medicine, New York).

Northerner and Southerner had different therapeutic needs. The epidemiological, meteorological, demographic, and social differences between Europe and America similarly demanded that therapeutics be adjusted for application within these different contexts.[9]

Most objections to importing French practice hinged upon one fact: French medical therapeutic knowledge, as it presented itself to Americans, was essentially equivalent to knowledge produced in the Paris hospitals. American physicians pointed out that the therapeutic requirements of patients in Paris differed fundamentally from those of Americans who lived in smaller towns or rural areas. A student attending Benjamin W. Dudley's lectures in Lexington, Kentucky, for example, recorded in his class notebook, "The treatment of Erysipelas in Paris, London and some other large cities is of the Tonic and stimulating kind, here is it directly the reverse, Depletory."[10]

But rural-urban differences aside, the pauperized, hospitalized French man or woman who made up the Paris clinical school's human material was not regarded as an acceptable therapeutic analogue to the American patient seen by a physician in private practice. Charles Caldwell returned to Transylvania University from a visit to London and Paris to tell his students, "The Hospitals of those great cities were very extensive and filled with persons labouring under great varieties of diseases; but they were from the very dregs of society[,] a class whose constitutions have been depraved by intemperance and want, and modified by vice, habit and climate until they possess no analogy in constitution or disease to any class in our own country." He cautioned that "from this class or this kind of case is the student of medicine to derive his knowledge and experience in visiting the Hospitals of London & Paris; and their constitutions and diseases are so modified and so totally different from those in our own country, the knowledge of Pathology and Therapeutics to be gained by visiting these hospitals can be of but little advantage to the practice of Medicine in the United States."[11] The Mississippi practitioner Samuel A. Cartwright used the same reasoning but a more extreme case to make the same point. "The treatment best adapted to the diseases of the half-starved paupers of the European hospitals, is so little applicable to our full-fed negroes, as to drive their owners from all those doctors who pursue such a practice in the treatment of their people. Not because they dislike European learning, but because their negroes die under it."[12]

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[9] The principle of specificity is discussed in the context of its meaning for therapeutic nationalism and regionalism in Numbers and Warner, "Maturation of American Medical Science", John Harley Warner, "The Idea of Southern Medical Distinctiveness Medical Knowledge and Practice in the Old South," in Ronald L Numbers and Todd L Savitt, eds, *Science and Medicine in the Old South,* forthcoming, John Harley Warner, "A Southern medical reform the meaning of the antebellum argument for Southern medical education," *Bull Hist Med*, 1983, *57* 365, and *idem*, "Medical practice and professional identity specificity and universalism in the arbitration of therapeutic knowledge," paper presented at a session on "Regional Styles and Professional Identity in Nineteenth-Century America" at the biennial meeting of the American Studies Association, Memphis, Tenn, 1 November 1981 The best discussion of the principles that ordered medical therapeutic practice in nineteenth-century America is Charles E Rosenberg, "The Therapeutic Revolution Medicine, Meaning, and Social Change in Nineteenth-Century America," in Morris J Vogel and Charles E. Rosenberg, eds, *The Therapeutic Revolution Essays in the Social History of American Medicine* (Philadelphia· University of Pennsylvania Press, 1979), pp 3–25

[10] R. T Dismukes, Notes on B W Dudley[,] Prof of Anatomy & Surgery[,] A.D 1838 & 9[,] in the Medical Department of Transylvania University, Lexington, Kentucky, Manuscripts Department, William R. Perkins Library, Duke University, Durham, North Carolina.

[11] Courtney J Clark, Notes on the Medical Lectures of Charles Caldwell, Medical Institute of Louisville, Kentucky, 1841–1842, Courtney J Clark Papers, Manuscripts Department, Perkins Library, Duke University

Underlying most comparisons of French and American therapy was the belief that the constitutions of Americans, and of American diseases, were inherently more energetic than those of Europeans. The origins of this idea can be traced back at least to the late eighteenth-century American defense against the Buffon-De Pauw thesis, which postulated the physical degeneracy of animal life in the New World. Like Jeffersonian claims that there were live mammoths roaming somewhere on the North American continent, the supposed robustness of American physiology in health and disease served to refute the Buffon-De Pauw thesis by demonstrating the vigor of organic life in America on a scale unmatched in Europe.[13]

The Jeffersonian physician Benjamin Smith Barton, echoing a view held by Benjamin Rush, his predecessor at the University of Pennsylvania, had noted in his medical lectures in 1815 that whereas Americans ordinarily required depletion when sick to drain off excess energy, enfeebled Europeans usually required therapeutic elevation. The stimulant cinchona bark, he told his classes, "has not been infrequently employed in Erysipelas particularly in Europe. But in the U. States the disease differs essentially from what it is in Europe. In Europe it is in general attended [by] prostration of strength and debility, and requires the invigorating method of cure. But in the U. States this disease is in general one of the Phlegmasia of an inflammatory character and requires the antiphlogistic method of cure." The same pattern held in other diseases; chorea, for example, assumed a debilitated form "in the enervated and enfeebled inhabitants of Europe. But in the U. States where the Blessings of Liberty are combined with the numerous other causes in developing the Physical man, this disease is usually of the tonic and sthenic character," calling for therapeutic lowering by bleeding and purging.[14]

The differences in therapeutic needs between Paris and America meant that French therapeutic knowledge was not merely irrelevant in managing an American patient, but could be actively harmful by recommending the very opposite of the treatment required. Any doctrinaire adherence to the example of French therapeutic practice would therefore be professionally irresponsible. It was an easy extension from this to the notion that European medicine's hegemony in American institutions of medical education, such as schools, textbooks, and journals, was a source of many of the profession's problems. "Foreign writers are but very poor guide[s], and we must resort to American writers if we wish to learn the full extent to which we may safely and surely carry our remedies," one physician claimed in 1832. Americans, he asserted, must "no longer suffer themselves to rest satisfied with the imbecility of European practice."[15] French therapeutic teachings, many Americans believed, could lead to inferior practice that would engender public distrust of the regular profession and thereby foster sectarian power.

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[12] Samuel A. Cartwright, "Alcohol and the Ethiopian, or, the moral and physical effects of ardent spirits on the Negro race, and some account of the peculiarity of that people," *New Orleans Med. Surg J*, 1853–54, *10* 161

[13] See Gilbert Chinard, "Eighteenth-century theories on America as a human habitat," *Proc. Amer Phil Soc*, 1947, *91* 27–57, Antenello Gerbi, *The Dispute of the New World The History of a Polemic, 1750–1900,* trans Jeremy Moyle (Milan-Naples Riccardo Riccardi Editore, 1955, Pittsburgh Pittsburgh University Press, 1973), and George Rosen, "Political order and human health in Jeffersonian thought," *Bull. Hist Med.*, 1952, *26* 32–44

[14] James Rackliffe, Notes on the Lectures of Benjamin S Barton, Philadelphia, 1 November 1815, Trent Collection, Duke University Medical Center Library, Durham, North Carolina, see Numbers and Warner, "Maturation of American Medical Science"

The principle of specificity also informed objections to the therapeutic skepticism that typified the Paris clinical school. French therapeutic thought was far from monolithic, yet most Americans saw as its characteristic features a distrust of the efficacy of remedies and an expectant method of treatment that gave primacy to the healing power of nature. The imperative to intervene was critical to American physicians' professional identity, while therapeutic skepticism seemed to imply a "do-nothing" plan of practice and an abnegation of professional responsibility. Although a non-interventionist plan might perhaps be suited to the inmates of Parisian hospitals (and of this Americans had their doubts), most American physicians agreed that it was not appropriate for American circumstances, which demanded active treatment. An Ohio practitioner assured his readers that he was not one of those physicians "who prate to you about not giving much medicine. Such talk betrays infidelity to the healing art."[16] Thus what Americans saw as the principal message of French therapeutic practice—skepticism expressed at the bedside as the expectant method—seemed to endanger professional rectitude and warrant the suspicion that French therapeutic practice was professionally immoral.

Underlying American physicians' discomfort with the passivity of French therapy was the fear that it threatened the foundations of what it meant to be a physician. The American physician's objective, members of the profession maintained, was primarily practical; he might be both scientist and practitioner, but the former was to be consistently subordinated to the latter. Many Americans feared that the "scientific" emphasis in French medicine, taken to mean a primary orientation toward understanding disease rather than intervening in it, could subvert practical medicine. Even those Americans who were most enthusiastic about the promise of French medical science tended to believe that its practice embodied an embarrassing valuation of knowledge over healing.

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[15] "Celsus," "Treatment demanded by malignant diseases," *Boston Med. Surg J*, 1832, *6* 141

[16] Alex. M McBride, "A chemico-pathological classification of fevers, and hints at treatment based thereon," *Cincinnati Lancet Obs*, 1864, n.s *7*· 23, and see Rosenkrantz, "Search for Professional Order," and Warner, "'Nature-trusting heresy'" A brief survey of Parisian therapeutic teachings is Erwin H Ackerknecht, "Die Therapie der Pariser Kliniker zwischen 1795 und 1840," *Gesnerus*, 1958, *15* 151–63

Many American practitioners shared the perception that the clinicians of the Paris school were not particularly concerned with curing their patients. "The French physicians study 'Diagnocis' [*sic*] or the course of diseaes [*sic*]," a student in South Carolina wrote in his lecture notebook in the mid-1850s. "They care very little whether the patient get[s] well or not so long [as] they understand the cause and discrimination. They are the best discriminating physicians in the world but not the best curers."[17] A Cincinnati practitioner who concurred in this appraisal charged that "the temporizing course pursued by the French renders their therapeutics often inefficient," referring to the expectant method. "In anatomy, physiology, and pathology, they stand unrivalled, but beyond this they seem scarcely to look. Having made a *diagnosis*, the next most important matter is to prove its correctness; and, as this can only be verified in the *dead body*, more enthusiasm is manifested in a post mortem examination than in the administration of medicine to cure disease. *The triumph with these physicians is in the dead-room.*"[18] To some Americans, this apparent Parisian therapeutic apathy represented the evil potential of therapeutic skepticism to support the conclusion that because little could be done to cure disease, the physician should devote his energies wholly to understanding it.

A variation on this perception held that French physicians were not simply passively uninterested in treatment, but actively placed science above healing. According to this view, the expectant method was not merely an expression of greater faith in nature than the art of medicine in healing, but could represent a purposeful avoidance of intervention for the sake of pathological enthusiasm. "In the Parisian hospitals," observed a Philadelphia medical professor who had just returned from France, "there is . . . often noticed such an intense devotion to mere scientific investigations, as causes the prescriber to forget the cure of the patient, in his anxiety to study the pathology of the complaint; and there is frequently more interest apparent on the part of their students, in noticing the post-mortem appearances, than there is in observing the restoration of health."[19] Robert Peter, who travelled from Kentucky to Paris in 1839 to purchase books, apparatus, and anatomical preparations for Transylvania's medical school, wrote to his wife that while Paris offered great opportunities for medical study, practice was better taught in Lexington. "If we judge of the value of their [French clinicians'] medical theories and discoveries by the amount of patients they cure here," he observed, "they are infinitely below our American practitioners—their proportion of losses . . . is immense—Indeed, human life is not esteemed of much value in the hospitals of Paris—an experiment is worth a dozen lives."[20]

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[17] Edward Keller, Diary as a Student at S[outh] C[arolina] College and Lecture Notes on Lieber, Geddings, Laborde, 1849–1859; the quotation is from "Remarks and Lectures of Dr Laborde for the Sopho[mo]re Class of 1854 Concerning Physiology," South Caroliniana Library, University of South Carolina.

[18] "[Review of] William Stokes (Dublin), *Lectures on the Theory and Practice of Physic*, & John Bell (Phila.), Phila., 1846," *Western Lancet*, 1842–43, *1* 354

[19] "Foreign hospitals" [extract from lecture of Prof Henry H Smith, University of Pennsylvania], *New Orleans Med Surg J*, 1856–57, *13* 242–43

It was not self-evident to most American physicians that increased knowledge of pathology would make a better therapeutist. While some Americans maintained that the pathological inquiries of the Paris clinical school offered a promising avenue to therapeutic advancement in the future, they often envisioned that future as very distant indeed. This seemed to be confirmed by the point on which virtually all American physicians agreed, namely, that while the French excelled in pathology, they were inferior to Americans in the practice of therapeutics. James Jackson, Jr., who was one of the most ardent disciples of Parisian methods of studying disease, was indignant about the feebleness of the therapeutic practice he witnessed soon after his arrival in Paris in 1831. He wrote enthusiastically to his physician-father in Boston describing the large number of patients with bronchitis he had observed and the splendid opportunity they presented for studying the natural history of the disease. But he then digressed: "I cannot help stopping a moment to speak of the impotent and of course inefficient efforts to save the lives of those thus affected." Venesection was rarely used in treatment, he noted critically, and "instead of trying the effects of emetics and extensive blisters—as we sh[oul]d do, they wait till death is just at hand and then, order a blister of 3 inches square to the legs or thighs—it is really aggravating to see the corpses upon the tables stained by the marks of this useless painful practice. I have read of French practice and heard of it, but I had not the slightest concept[io]n of how little they are acquainted with the science of Therapeut[ics]."[21] The Virginian James Lawrence Cabell mirrored the nearly universal American appraisal of French therapeutics when he wrote to his uncle from Paris, "I am far from being disappointed in the estimate I had formed of the capacity of the French physicians in discovering the exact seat of disease under the most complicated appearances; their skill is truly wonderful; but I have little confidence in their application of remedies."[22]

Some physicians feared that this inversion of the proper ranking of healing above knowledge could infect American medicine. "According to modern notions, traceable to a Gallic origin," commented a Boston physician,

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[20] Robert Peter to Frank [Frances] Peter, Paris, 22 June 1839, Evans Papers, University of Kentucky On Peter's appraisal of the prospects for medical teaching in Europe compared with Transylvania, see Robert Peter to Frank [Frances] Peter, London, 11 August 1839

[21] James Jackson, Jr to James Jackson, Sr, Paris, 26 June 1835, Jackson Papers, Francis A. Countway Library of Medicine

[22] James Lawrence Cabell to Uncle [Joseph C Cabell], Paris, 28 January 1837, James Lawrence Cabell Papers, Manuscripts Department, Alderman Library, University of Virginia

"it is scientific to watch the phenomena of diseases, but vulgar as well as unphilosophical to make any attempts to disturb the regular laws by which they are governed. Thus it is continually said of eminent practitioners, in relation to curative measures, that they do nothing at all." All "honest men," he continued, must resist this French tendency, for, as he cautioned, "those foreign opinions, which consider the most desirable issue of any disease to be one that opens an opportunity for inspecting its locality, are somewhat contagious; and it is greatly to be feared that the effect, in sequel, will be decidedly unfavorable, if some counteracting influence is not opposed."[23]

Such perceptions of the inferiority and inapplicability for Americans of the Paris school's therapeutics constituted a serious indictment of France as a source of knowledge about therapeutic practice. A Cincinnati physician reviewing the investigations of the Parisian clinician Gabriel Andral concluded, "We are willing to rely on Andral in Pathology, but in therapeutics we will go elsewhere for instruction."[24] There was simply no reason for Americans to travel abroad in search of a commodity that could be found in a better form and more cheaply domestically. More than this, many American physicians saw in the characteristic Parisian union of scientific excellence with therapeutic impotence a threatening model for themselves. "Physicians should never resemble those philosophers who pursue science or literature in the abstract, either for its own sake, or to furnish materials for others to employ. All the pursuits of practicing physicians should have a practical tendency," one physician argued. "They are always out of their course, when they lose sight of practical utility."[25] A New England medical teacher similarly asserted that "with physicians, the *cui bono?* will this make me a better practitioner?—is the only important object."[26]

The most extreme fear that the Paris model aroused in Americans was that excessive scientific zeal could unfit a man for practice, replacing his responsibility to his patients with an allegiance to science. "No nation has contributed more, it is true, to the progress of medicine than the French," wrote Harvard medical professor John Ware. "But their tendency is to be satisfied with the science."[27] Such a single-minded relish for science in a physician, Ware cautioned, could "vitiate his character as a practitioner."[28] Ware's selection of the word "character" is telling, for in antebellum American thinking it was as much a man's character as his knowledge that made him a proper, and effective, physician The fear that devotion to science could corrupt the practitioner made many of the American physicians who studied in Paris wary of being tainted by it. Indeed, the premise from which such fears took form was written into the American Medical Association's code of ethics: "No scientific attainments can compensate for the want of correct moral principles."[29] In their letters from Paris, Americans often commented with disapproval on the brutality of French physicians and their violations of patient modesty, traits that further disinclined Americans from using the Parisian patient care they witnessed as a model for treating their own patients.[30]

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[23] "Modern practice of medicine," *Boston Med. Surg J*, 1835, *12* 351, 352

[24] "Andral's medical clinic," *Western Lancet*, 1843–44, *3* 148

[25] "Z.," "Medical improvement—no VII," *Boston Med Surg J*, 1834, *9* 194

[26] "S.," "Medical improvement," *Boston Med Surg J*, 1834, *9* 204

[27] John Ware, "Success in the medical profession," *Boston Med. Surg J*, 1850–51, *43* 509

[28] *Ibid.*, p 499

Many of the American physicians who studied in Paris were deeply troubled by the specter of the science-oriented French clinician who appeared devoid of the moral sensitivities they esteemed in a practitioner. Even the most devoted American disciples of French medicine perceived their mentors' scientific devotion and therapeutic apathy as a weakness in their professional character. Indeed, when James Jackson, Jr. first witnessed the therapeutic practices of the Paris clinician Pierre C. A. Louis, whom he later came to idolize as his second father, he was seriously disturbed by his preceptor's lack of interest in curing patients. In one letter he wrote in Paris that was later published by his father, Jackson, Jr. praised highly Louis's clinical teaching and skill in arriving at a diagnosis. But before publishing the letter the elder Jackson edited out his son's additional comment on Louis that after making his diagnosis, "he finishes there—he is very weak at therapeut[ics], and is perfectly satisfied c[um] a correct diagn[osis]."[31]

To be sure, financial and familial constraints, as well as the restrictions of the professional environment in America, made it unlikely that scientific excesses would imperil the character of American physicians. James Jackson, Sr. had cautioned his son studying in Paris that too much knowledge could interfere with the practitioner's efforts at the bedside, writing that "a man may learn so much before he begins to practice as to prevent his doing well."[32] Yet the younger Jackson still wanted to devote several years to clinical research before starting to practice, and Louis wrote to Jackson, Sr. endorsing his son's plan. "I recommend this to you, because no one is more capable than he is of cultivating the *science and thereby* of making progress in the *practice,* for what is practice but science put into operation."[33] But the elder

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[29] John P Harrison, "Medical ethics," *Western Lancet,* 1848–49, *8* 69

[30] Robert Battey to Mary [Battey], Paris, 23 February 1860, Robert Battey Family Papers, Special Collections Division, Woodruff Library, Emory University, Stephen Henry Bronson to Henry Bronson, Paris, 18 December 1867, Yale Medical Historical Library, New Haven, Conn., "Foreign correspondence," *Nashville J Med Surg,* 1857, *12* 304, Benjamin J Hicks to John Y Bassett, Paris, 31 July 1837, John Y Bassett Papers, Maps and Manuscripts Division, Alabama Department of Archives, Robert Peter to Frank [Frances] Peter, Paris, 27 June 1839, Evans Papers And see Jones, "American doctors and the Parisian medical world," pp 191–93

[31] Cf James Jackson, Jr to James Jackson, Sr, Paris, 6 November 1831, Jackson Papers, and the published version of the same letter in James Jackson, *A Memoir of James Jackson, Jr, M.D, with Extracts from His Letters to His Father and Medical Cases, Collected by Him* (Boston I R. Butts, 1835), pp 86–88 For a literary portrayal of a Paris clinician who embodied the worst of the characteristics that troubled Americans, and which Louis's Boston pupil Oliver Wendell Holmes recognized to be a depiction of his own mentor, see Eugène Sue, *The Mysteries of Paris,* 3 vols (Paris, 1843, London Chapman and Hall, 1846), 3 chap 54, "The Hospital," pp 291–313, and see Oliver Wendell Holmes, "Experiments in medicine," *Boston Med. Surg J,* 1844, *30* 201–3

[32] James Jackson, Sr to James Jackson, Jr, Waltham, Massachusetts, 16 June 1832, Jackson Papers

[33] Pierre Louis to James Jackson, Sr, Paris, 22 May 1833, Jackson Papers

Jackson rejected this postponement of practice for the sake of scientific investigation, "because," as he later explained,

> in this country his course would have been so singular, as in a measure to separate him from other men We are a business doing people. We are new. We have, as it were, but just landed on these uncultivated shores; there is a vast deal to be done; and he who will not be doing, must be set down as a drone. If he is a drone in appearance only and not in fact, it will require a long time to prove it so, when his character has once been fixed in the public mind[34]

Throughout his stay in Paris, though, Jackson, Jr., like most Americans, maintained that reliable therapeutic knowledge for American practice could not easily be obtained abroad. To study medical treatment, he explained to his father, he would wait until he returned to Boston.[35]

In vivid contrast to their rejection of French medical therapeutic practice, the American physicians who studied in Paris avidly took up the therapeutic epistemology that underlay this practice and urged it upon their brethren after their return. The characteristic feature of the Paris clinical school's therapeutic epistemology, which referred to the sources, production, and character of knowledge, was its active denunciation of rationalism and an allegiance to clinical empiricism in the tradition of Condillac and Cabanis. This included a critical attitude toward all existing therapeutic precepts, and the belief that it was through empirical observation alone that therapeutic progress would come. All practices were to be held suspect until validated anew by observation at the bedside. In America, the ruthless reappraisal of prior therapeutics informed by the commitment to empiricism greatly contributed to the transformation of nineteenth-century medical practice.[36] What accounts for Americans' selectivity in transplanting French therapeutic epistemology but not practice to their own country? If they avoided the taint of Parisian practice, why did they choose to embrace so openly its epistemological underpinnings?

In part, therapeutic epistemology and practical medical precepts fit into categories of medicine that were judged by different criteria. Throughout the first two-thirds of the nineteenth century American physicians made a fundamental division between those parts of medicine that were universal in their application and validation, and those that were governed by the principle of specificity. The universal categories included knowledge about the basic medical sciences (such as chemistry, physiology, and anatomy), the underlying principles of medicine, and the mechanical manipulations of surgery and dentistry. These were independent of environment and valid everywhere. Epistemology was included in the principles of medicine. Practical therapeutic precept, on the other hand, fell under the sway of the principle of specificity, which meant that knowledge was best gained and tested in circumstances (such as environment and type of patient) that closely approximated those in which it would be applied. The objection that French therapeutic practice was inappropriate for America simply did not apply to French therapeutic epistemology.

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[34] Jackson, *Memoir of James Jackson, Jr*, pp 55–56

[35] For example, see James Jackson, Jr to James Jackson, Sr, Paris, 18 February 1832, and London, 12 September 1832, Jackson Papers

[36] American physicians during this period ordinarily framed issues in therapeutic epistemology as a stark dichotomy between rationalism on the one hand (linked with hypothesis, theory, reasoning, and grand unified systems of pathology and therapeutics) and empiricism on the other (associated with observation, allegiance to fact, and hostility to theory) A useful survey of epistemological change and the persistent tension between rationalism and empiricism in American medicine is Richard H Shryock, "Empiricism versus rationalism in American medicine, 1650–1950," *Proc Amer Antiquarian Soc*, 1969, n s. *79* 99–150. Of a large literature on the French medical empiricism that was a resource for Americans, see Erwin H Ackerknecht, *Medicine at the Paris Hospital, 1794–1848* (Baltimore The Johns Hopkins Press, 1967), and George Rosen, "The philosophy of ideology and the emergence of modern medicine in France," *Bull Hist Med*, 1946, *20* 328–39

The fundamental distinction between epistemology and practical precept in medical therapeutics was only a permissive factor, however. It explained why Americans *could* transplant Parisian epistemology to their native soil, not why they did so. After all, American physicians openly doubted whether Parisian empiricism had substantially improved the treatment of French patients; American therapeutic practice, in the judgment of those students who witnessed the French, remained far superior. American physicians' exposure to French epistemology certainly did not compel them to transmit it, as their condemnation of French therapeutic precept illustrates. What remains to be explained is not how they were able to transport Parisian empiricism, but why in fact they chose to take it up and energetically proselytize it in America.

The active transport of Parisian therapeutic epistemology to America is best understood in terms of the particular social situation and needs of the medical profession in America during the period that coincided with the height of French influence, the 1820s through the 1850s. Like the members of the other professions in America during these decades, physicians believed that the power and prestige of their profession as a whole was declining. Populistic medical sects like Thomsonianism, as well as sects such as homeopathy that appealed to a more affluent clientele, challenged the orthodox profession's claims to intellectual and therapeutic superiority and its economic well-being. The rescinding of medical licensing laws by the states in the 1830s and 1840s emblemized the stripping away of professional privilege that had been principally honorific but nonetheless important. Regular physicians saw in these phenomena the debasement of their profession in the public's appraisal. The proliferation of proprietary medical schools of low standards, which greatly increased the number of poorly trained practitioners, was a further indicator of professional descent. Tensions were aggravated by the fact that in addition to this increase, the number of well-trained physicians was also expanding. More physicians than ever were acquiring rigorous medical training, particularly in Paris. These men often held inflated aspirations for the quality of the profession's knowledge, practice, and institutions, and were well prepared both to condemn their backward brethren and to urge them to reform in order to improve the profession's standing.[37]

The desire to shore up the profession was expressed in a variety of ways, including the founding of medical societies on the local, state, and national levels; the development of formalized codes of medical etiquette; the establishment of programs to raise standards of medical education; and the drawing up of plans to promote medical literature and public health enterprise.[38] But the adjustments physicians made in response to the position of their profession were not limited to its social organization and institutions. They extended to its cognitive structures as well. Rationalistic systems of medical practice, such as those of Benjamin Rush, William Cullen, John Brown, and John Esten Cooke, came to represent to many physicians a major cause of the profession's degradation. The American physicians who studied in Paris from the 1820s onward commonly saw one avenue to the vindication and elevation of their profession in French therapeutic empiricism, and in its potential use in attacking rationalistic systems. Pierre Louis correctly described the task his American students had set for themselves when he wrote to Henry Ingersoll Bowditch in 1840 that they were constructing "a barrier against the spirit of system."[39] By denouncing the internal sources of the profession's problems, by dismantling systems, and by substituting an empiricism and allegiance to fact for an ostensibly rigid rationalism, regular physicians sought to use therapeutic empiricism as a vehicle for professional uplift. The empiricist assault upon systems that was mounted in the 1820s intensified so that by the 1840s and 1850s the very term "system" had become an epithet of derision in American therapeutic rhetoric.

Regular physicians held rationalistic systems accountable for the lowered standing of their profession in a variety of ways. One pernicious tendency of systems, many critics maintained, was to generate overconfidence in drugs. This, in turn, encouraged therapeutic extremism and practice by rote, which discredited the regular armamentarium. Rationalism, the Paris-trained physician and ardent empiricist Elisha Bartlett charged, was responsible for "the abominable atrocities of wholesale and indiscriminate drugging."[40] The fact that sectarians exploited examples of regular therapeutic routinism and excesses further aggravated orthodox physicians' discomfort. Regulars also regarded the foundations of such sects as Thomsonianism and homeopathy as themselves systems of practice; indeed, Hahnemann had cast homeopathy in substantially the same mold of Enlightenment rationalism that had given shape to the systems of Cullen, Brown, and Rush. The rise of this explicitly heterodox system of medicine at the very time that regulars were embracing the ideal of empiricism encouraged those orthodox physicians who did not convert to homeopathy to dissociate themselves from its adherents and its intellectual misdirection, including its grounding in rationalism.[41]

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[37] On the perception of decline in the professions in antebellum America, see Daniel H Calhoun, *Professional Lives in America Structure and Aspiration, 1750–1850* (Cambridge, Mass Harvard University Press, 1965), pp 178–97 On medical licensing, see Joseph F Kett, *The Formation of the American Medical Profession The Role of Institutions, 1780–1860* (New Haven and London Yale University Press, 1969), and Richard Harrison Shryock, *Medical Licensing in America, 1650–1965* (Baltimore The Johns Hopkins Press, 1967) Of an ample literature describing sectarian assaults upon the orthodox profession, among the most useful overviews are Alex Berman, "The Impact of the Nineteenth Century Botanico-Medical Movement on American Pharmacy and Medicine" (Ph D diss , University of Wisconsin-Madison, 1954), Harris L Coulter, *Divided Legacy. A History of the Schism in Medical Thought*, 3 vols (Washington, D C McGrath Publishing, 1973–77), 3. *Science and Ethics in American Medicine 1800–1914*, and William G Rothstein, *American Physicians in the Nineteenth Century From Sects to Science* (Baltimore and London The Johns Hopkins University Press, 1972), pp 125–74, 217–46 The most useful survey of antebellum medical schools remains William Frederick Norwood, *Medical Education in the United States before the Civil War* (Philadelphia. University of Pennsylvania Press, 1944), on the content and diversity of training, see Ronald L Numbers, ed , *The Education of American Physicians Historical Essays* (Berkeley, Los Angeles, and London University of California Press, 1980)

[38] On medical societies, see James G Burrow, *AMA. Voice of American Medicine* (Baltimore The Johns Hopkins Press, 1963), Ronald L Numbers, "Public Protection and Self-Interest. Medical Societies in Wisconsin," in Ronald L Numbers and Judith Walzer Leavitt, eds , *Wisconsin Medicine· Historical Perspectives* (Madison University of Wisconsin Press, 1981), pp 75–104, and Rothstein, *American Physicians*, pp 63–121 On the use of institutional reform as a means of uplifting the profession as a whole in one region, see Warner, "A Southern medical reform," pp 364–81

[39] P. C A. Louis to H I Bowditch, Paris, 5 February 1840, Francis A Countway Library of Medicine

The notorious disunity among regular physicians, seen as another manifestation of professional degradation, was also blamed on systems. Reformers argued that discord among the advocates of competing regular systems of practice generated destructive professional strife.[42] Further, the blind devotion to systematic rules in practice damaged the profession's standing by rigidifying the medical mind and blocking therapeutic progress. Rationalistic systems, one Ohio practitioner typically concluded, "had done more to impede the progress of medicine than almost all other causes combined."[43] Thus physicians believed that faith in rationalistic systems undermined the profession's reputation in the eyes of the public, elevated their sectarian competitors by comparison, diminished regular physicians' ability to heal, and hampered the profession's ability to upgrade its position.

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[40] Elisha Bartlett, *Essay on the Philosophy of Medical Science* (Philadelphia. Lea and Blanchard, 1844), p 290 On Bartlett's exposition of Parisian empiricism, see Erwin H Ackerknecht, "Elisha Bartlett and the philosophy of the Paris clinical school," *Bull Hist Med.*, 1950, *24* 43–60 On the discrediting of regular therapies by systematic routinism, see also J Y. Henry, "Medical Systems" (M.D diss, Transylvania University, 1843), Special Collections and Archives, Frances Carrick Thomas Library, Transylvania University, Lexington, Kentucky, and B Burgh Smith, "Country Fever" (M D diss, Medical College of the State of South Carolina, 1836), Waring Historical Library Annex, Medical University of South Carolina, Charleston.

[41] George Washington Bowen, Notes Taken on Lectures Given by Chas D Williams on the Institutes and Practice of Homoeopathy, Cleveland Institute of Homoeopathy, 1851–1852, Western Reserve Historical Society, E[rasmus] D[arwin] F[enner], "Review of *Homoeopathy, Allopathy, and 'Young Physic,'* by John Forbes, (Phila., 1846)," *New Orleans Med Surg J*, 1845–46, *2* 760–61, Joseph LeCont[e], "On the science of medicine and the causes which have retarded its progress," *Southern Med Surg J*, 1850, n s *6* 457, and "Medical systems and habits," *Western Lancet,* 1842–43, *1* 234–35

[42] Samuel L. McKeehan, "Nosology" (M.D diss, Washington Medical College of Baltimore, 1829), Joseph M Toner Papers, Manuscript Division, Library of Congress, "Medical delusions," *Western Lancet,* 1842–43, *1* 477

[43] Hamilton County Medical Club, Minutes of Meetings, 21 May 1842–4 April 1850, remarks of Dr Dodge at meeting of 7 October 1847, History of Medicine Division, National Library of Medicine, Bethesda, Maryland And see John C. Cardwell, Notes Taken on Lectures Given by James Conquest Gross, Transylvania University Medical Department, Lexington, Kentucky, 1843–44, Drake Papers, Horine Collection, Special Collections, King Library, University of Kentucky, Thomas Henderson, "Cases of pulmonary consumption, with observations," *Boston Med Surg J*, 1831–32, *5* 121, John A. Lyle, "Exclusive Systems of Medicine" (M D diss, Transylvania University, 1841), Special Collections and Archives, Thomas Library, Transylvania University, and Tho[ma]s D Mitchell, "Calomel considered as a poison," *New Orleans Med J*, 1844–45, *1* 32

A crusade against rationalistic systems declared under the banner of empiricism—the empiricism that Americans found expressed so clearly in Paris—gave regular physicians who were disturbed by the profession's standing a rallying point and a project for reform. The self-conscious reorientation toward empiricism in American medical rhetoric took on in part the form and role of a medical jeremiad. It was a lamentation of decline that explained the profession's shortcomings and called on physicians to repent and thereby reclaim for their profession its proper place. It also provided a concrete plan for action, a project by which to improve medical practice and the profession's standing through epistemological change. Physicians hoped to better practice by altering the knowledge that justified and directed it, substituting a discriminating, moderate practice carefully grounded in experience for the mechanical practice and therapeutic extremism associated with rationalistic systems. Therapeutic knowledge was to be improved by pruning out the errors of rationalism, and by making new additions through empirical clinical observation. A primary allegiance to facts would reduce professional disharmony among regular physicians by minimizing the divisive influence of commitments to conflicting systems of practice. By providing better practice, and by presenting a unified professional front, regular physicians would scotch sectarian competition and criticism and elevate the profession in the public's regard. The potential Americans saw in Parisian empiricism as a professional leaven gave them an incentive for bringing it back with them to America.

Physicians' anxieties about their profession were allayed by the very act of attacking systems. "System" took on the role of villain: it was an identifiable target which a degraded profession could blame for its woes. Attacking medical systems was a symbolic action against the sources of professional despair, and the vehemence of the attack reflected the intensity of the anxiety that drove it. At the same time, by denouncing this symbolic entity physicians could optimistically assure themselves that the medical profession would not stay in the anomalous position it temporarily occupied. An assertive proclamation of allegiance to empiricism and an aggressive attack on rationalistic systems meant that the profession was actively doing what was necessary in order to redeem itself. Analyzing systems of practice in order to condemn them gave physicians a medium through which they could express, comprehend, and act on the sources of strain in the profession.

The openness of American students to the therapeutic epistemology of the Paris school made them less instead of more receptive to French teachings about therapeutic practice. According to the French view, therapeutic change would come about through empirical observation of diseases and the actions of remedies on them. Such a belief, reinforced for Americans by an underlying faith in the principle of specificity, encouraged the notion that therapeutic knowledge suited for the American context was best generated and validated by observing the operation of therapies on American patients in the American environment. The Parisian emphasis on empirical clinical observation was therefore inherently inimical to the American acceptance of French therapeutic knowledge.

One place this antagonistic relationship is apparent is in Americans' attitudes toward the application of Pierre Louis's numerical method to medical therapeutics. Even the most enthusiastic of Louis's American disciples questioned the applicability to American patients of the therapeutic conclusions he had drawn from observations of French hospital patients. Yet at the same time, and without contradiction, they endorsed the numerical method and believed that its application at the *American* bedside would transform American therapeutic practice. To be sure, the numerical method did not lack for American critics. For example, in 1840 the New York physician Martyn Paine published a two-volume work, *Medical and Physiological Commentaries,* which, in the appraisal of Louis's Boston pupil Henry Ingersoll Bowditch, had as its main object "a violent attack" on the numerical method, and on Louis in particular.[44] A prolonged dispute between Paine and Bowditch ensued. Paine's argument was that the numerical method ignored the differences in disease and therapeutic need imposed by different circumstances, especially a different environment or different type of patient. Louis's numerical method, he charged, "rejects all observation that is not founded upon it, brings pathology and therapeutics under the dominion of mathematics, regards not the various considerations which relate to climate, constitution, habits, age, sex, &c., and practically knows little else than a *balance sheet*"[45]

Bowditch's rebuttal to Paine was in effect an affirmation of Louis's belief in the principle of specificity. "It must be always kept in mind that Louis collected his facts in Paris, and from them deduced his results," Bowditch noted. "He did not, because he could not, observe in England or America."[46] Louis's statistics were derived from observation in the Paris hospitals, and Bowditch contended that no one, least of all Louis, would wish to suggest that conclusions drawn from them were applicable to a different situation, defined by a different location, warmer climate, or distinct patient population. As to the differences between the Paris hospitals and other contexts, Bowditch stated, Louis "left that for others and future observers to decide."[47] The ultimate implication of Bowditch's remarks for American physicians was that while Louis's method was useful and its underlying empiricist epistemology sound, conclusions derived from Louis's application of the numerical method to therapeutic evaluation in Paris were at best only suggestive for American practice. If American physicians wanted therapeutic knowledge meaningful for their own practices and patients, they would have to find it for themselves.

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[44] H[enry] I[ngersoll] B[owditch], "Medical and physiological commentaries," *Boston Med. Surg J,* 1840–41, *23* 73 Louis shared this assessment of Paine's treatise, see P C A. Louis's letters to H I Bowditch of 1 October 1840 and 3 June 1841, Francis A. Countway Library And see Martyn Paine, *Medical and Physiological Commentaries,* 2 vols. (New York. Collins, Keese, London John Churchill, 1840), and a third volume bearing the same title (New York Printed for the Author, 1841–44) in which Paine reprinted his replies to criticism of the first two volumes

[45] M[artyn] P[aine], "Dr. Paine's reply to H. I B ," *Boston Med Surg J,* 1840–41, *23* 236.

[46] B[owditch], "Medical and physiological commentaries," p 81 Paine especially assailed Louis's distinction between typhus and typhoid fever, charging that Louis glibly assumed that disease was the same in France, England, and the United States Dale C Smith discusses the debate that pivoted on this issue in "Gerhard's distinction between typhoid and typhus and its reception in America, 1833–1860," *Bull. Hist Med.,* 1980, *54* 368–85

[47] B[owditch], "Medical and physiological commentaries," p 89

The Parisian emphasis on empirical observation fostered the notion that in such realms of medicine as therapeutics, knowledge would best be obtained from the kinds of patients (in the particular circumstances) to which it would ultimately be applied. This, in turn, encouraged American physicians to place their trust only in facts that had been seen in America and interpreted through American eyes. "The school of Louis," the Philadelphia physician Robley Dunglison charged in 1839, was apt to make the physician rely on his own observation to the exclusion of all other practitioners' experience. It could, in other words, "convey the too exclusive idea, that self-observation is alone necessary to make the accomplished pathologist and physician."[48] Dunglison's remark was singularly perceptive. French clinical empiricism substantially contributed to a remolding of therapeutic epistemology in America, urging American physicians to observe for themselves the effects of their therapeutic efforts. At the same time, it strengthened the American profession's therapeutic nationalism by reinforcing the principle of specificity and the notion that foreign therapeutic knowledge was of dubious value for practice in America. It was the ultimate irony of the relationship between American physicians and French medicine that they could use the Paris clinical school's epistemology to invalidate much of its knowledge, especially therapeutic knowledge, for their own use.

The transmission of French therapeutics to America suggests a model of active and selective transference. In medicine as in other realms of culture, this model is more fitting than one of passive diffusion irrespective of whether knowledge is being transmitted across national boundaries, between disciplines, or among social classes. Sound knowledge does not simply travel to where it is in short supply by a process akin to osmosis.

In this particular case, Americans were repelled by some aspects of the therapeutic *practice* they witnessed in Paris and regarded others as irrelevant to their needs. In part, this judgment was informed by the principle of specificity and its therapeutic implications. But their distaste for French therapeutic practice was also shaped by the ways professional identity and morality were defined in American medicine, and especially by the primacy of practice for the American physician. Americans recognized that French values were not those of their own country, and that the features of therapeutic management they perceived as characteristic of Parisian clinicians—therapeutic apathy, brutality and insensitivity to patient modesty, and esteem for scientific knowledge over caring for patients—offered an undesirable model for the American practitioner. On the other hand, the American physicians who studied in Paris saw in the empiricism of French therapeutic epistemology a resource they could exploit to set aright the dislocation of the medical profession in America. They enthusiastically took up Parisian therapeutic epistemology and proselytized it to their American brethren. Far from being passive diffusion, the movement of the Paris clinical school's precepts to America was selective, active transport. The profession's values and its social and cognitive needs shaped both the particular barriers that had to be crossed and the choices of the individual physicians who selected those aspects of French medicine that they would take home with them to America.

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[48] "Dr Dunglison's introductory lecture," *Boston Med. Surg, J,* 1839, *21* 357.

THE IMMIGRANT MIDWIVES OF LAWRENCE: THE CONFLICT BETWEEN LAW AND CULTURE IN EARLY TWENTIETH-CENTURY MASSACHUSETTS[*]

Eugene Declercq and Richard Lacroix

In 1907 the Massachusetts Supreme Court ruled that the practice of midwifery was in violation of the state's Medical Practice Act of 1894.[1] In the same year, three midwives living in Lawrence, Massachusetts—Virginia Pedrazzini, Angelina DeMarco and Laura Carpenito—attended thirty-nine of the registered births. In 1913, six years after their practice was declared officially illegal, these three women attended 442 births and registered them with the Lawrence City Clerk.[2] Overall, the proportion of all registered births in Lawrence attended by midwives increased after the court's ruling from 38 percent in 1907 to 41 percent in 1913. The campaign to abolish midwifery in Massachusetts, the influence of the practice of midwifery in Lawrence and the factors that limited the initial impact of the campaign against it are the subject of this paper.

The national campaign against midwifery in the United States has been extensively documented elsewhere.[3] The center of opposition was Massachusetts. As a Pennsylvania physician remarked in 1915, "I know of no other section of the country which has been more successful in prohibition (of midwifery) than Massachusetts."[4] The legislative restriction of midwifery in the state was accomplished in several stages during the nineteenth century culminating with the Medical Practice Act of 1894.[5] It required that physicians be licensed and established penalties for those practicing obstetrics without a license.[6]

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[1] Supreme Judicial Court of Massachusetts, *Massachusetts Reports. Cases Decided and Determined by the Supreme Judicial Court of Massachusetts* (Boston Little, Brown, 1908), 196 (1907) 326–29 (hereafter cited as *Massachusetts Reports*)

[2] Lawrence City Clerk, Birth Registration Sheets, 1907–13, City Hall, Lawrence, Massachusetts

[3] See Judy Barrett Litoff, *American Midwives, 1860 to the Present* (Westport, Conn Greenwood Press, 1978), Jane B Donegan, *Women and Men Midwives Medicine, Morality and Misogyny in Early America* (Westport, Conn Greenwood Press, 1978); Frances E Kobrin, "The American midwife controversy· a crisis of professionalization," *Bull Hist Med*, 1966, *40* 350–63

[4] J. M Baldy, "Is the midwife a necessity?" *Amer J Obstet Diseases Women Children*, 1916, *73* 400.

[5] Secretary of the Commonwealth of Massachusetts, *Acts and Resolves of the Commonwealth of Massachusetts*, 1894, chap 458, pp 530–33 (hereafter cited as *Acts and Resolves*)

Was midwifery the same as obstetrics? The physicians who controlled the Massachusetts Board of Registration in Medicine contended that it was, and in the 1907 case of Commonwealth vs. Hanna Porn, the Massachusetts Supreme Court ruled that the midwife Porn's attendance at births was "contrary to the plain intent of the statute." The judge also noted Mrs. Porn's good character and suggested that it was possible for the Massachusetts legislature to "separate by a line of statutory demarcation the work of the midwife from that of the practitioner of medicine."[7] Such a distinction was never made as neither the Board of Registration in Medicine nor the Massachusetts Medical Society showed any interest in creating a system of education and licensing of midwives, such as the one which had been successfully developed in New Jersey.[8] Instead, the Porn decision, combined with an 1897 Birth Registration Act, put midwives in a double legal bind. The registration law required midwives and doctors to report all the births that they attended to the local city clerk, under penalty of a twenty-five dollar fine.[9] Therefore, if a midwife attended a birth and reported it, she was, in fact, admitting that she was practicing obstetrics. If she did not report the birth, she was breaking the Birth Registration Law.

When faced with these legal problems, a midwife could pursue one of four options. The first was to give up her practice, as many midwives in the Boston area apparently did[10] Second, she could continue to practice surreptitiously, hoping to avoid the attention of legal authorities. Third, she could become, in essence, an obstetrical nurse who worked under the close supervision of a physician.[11] Her final option was to join with other midwives and battle politically the medical associations opposing her. However, the midwives never developed sufficient political self awareness and organization to respond successfully to their male competitors.[12]

It has generally been believed that, given these limited options, midwifery practice in Massachusetts quickly died out.[13] This was not the case. Midwifery practice continued and, as the example of Lawrence will illustrate, flourished openly in some areas for almost a decade after the Porn decision. Since changes in the law did not free Massachusetts of midwives, opponents began to focus their efforts on influencing public opinion.

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[6] Reginald Fitz, "The Legislative Control of Medical Practice," in *Medical Communications of the Massachusetts Medical Society* (Boston Massachusetts Medical Society, 1894), pp 277–360

[7] *Massachusetts Reports*, 196 328

[8] John A. Foote, "Legislative measures against maternal and infant mortality the midwife practice laws of the states and territories of the United States," *Amer J Obstet Diseases Women Children*, 1919, *80* 534–51 See also James L Huntington, "The midwife in Massachusetts her anomalous position," *Boston Med Surg J*, 1913, *168* 418–21, Julius Levy, "Maternal mortality and mortality in the first month of life in relation to attendant at birth," *Amer J Public Health*, 1923, *13* 88–95

[9] *Acts and Resolves*, 1897, chap 444, pp 424–29

[10] J Whitridge Williams, "Medical education and the midwife problem in the United States," *JAMA*, 1912, *58* 1–7 See also Baldy, "Midwife a necessity?" p 401

[11] Arthur B Emmons and James L. Huntington, "A review of the midwife situation," *Boston Med Surg J*, 1911, *164* 261

[12] Litoff, *American Midwives*, pp 91–121

[13] David Stewart, *Five Standards for Safe Childbearing* (Marble Hill, Missouri. NAPSAC, 1981), p 126

The most vocal opponent of midwifery in Massachusetts, Dr. James L. Huntington, argued in a 1912 article in the *Boston Medical and Surgical Journal:* "But in (trying to stop midwifery), legislation is powerless. The keynote is education. We must educate the general public to realize the necessity for good obstetrics, and place the means of obtaining it at the disposal of all, and then with or without laws against the midwife, she will disappear from our cities."[14] The public education campaign advising women to consult physicians about obstetrics and not midwives, which began in the late nineteenth century, was to continue into the 1930s.[15] One of the factors involved was a redefinition of birth as a disease rather than a natural process.[16] Physicians stressed the pain of childbirth and the value of obstetrical anesthesia such as Twilight Sleep which could be administered only by a doctor in a hospital.[17] Class and racial bias were also invoked against the midwives.[18] Finally, hospital births were portrayed as a matter of status as well as of safety.[19] The cumulative impact of this educational campaign was substantial. A woman having a midwife as a birth attendant would not only be putting herself and her baby at needless risk of death, she would also be experiencing much greater pain than necessary by trusting her fate to a woman who generally served only those too ignorant to know any better. This was the message carried directly to women by physicians in lectures and public forums and also in articles in popular women's magazines.[20] Ironically, two of many women's greatest fears, the episiotomy and the use of forceps, became symbols of the technology medicine could bring to the aid of the parturient woman.[21] Still midwives continued to practice in Massachusetts in part because of the support of the only class of medical practitioner that medical societies viewed as worse than the midwife: the "ignorant and often unscrupulous" doctors who helped them.[22]

At a meeting of the Massachusetts Medical Society on 30 December 1913, Dr. Hugh Cabot complained that some members of the society were assisting midwives by ". . handing in birth returns for cases over which they have had no supervision."[23] Cabot felt that physicians must be enjoined from this practice. One step had been taken in 1912 by a change in the Birth Registration Law which required physicians to indicate on birth returns whether or not they had personally attended. A second, more direct attempt to control physicians' activities was manifested in a 1917 amendment to the Medical Practice Act. By this a physician could lose his license for one year if he "... acted as principal or assistant in carrying on the practice of medicine by an unregistered person."[24]

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[14] James L. Huntington,"The regulation of midwifery," *Boston Med Surg J*, 1912, *167* 86

[15] Litoff, *American Midwives*, pp 64–90

[16] Joseph B. DeLee, "Progress toward ideal obstetrics," *Trans Amer Assoc. Study Prevention Infant Mortality*, 1915, *6* 117

[17] Judith Walzer Leavitt, "Birthing and anesthesia· the debate over Twilight Sleep," *Signs*, 1980, *6* 147–64.

[18] One article described the immigrant midwife as a woman who "knows nothing of hygiene, asepsis or antisepsis and is often practically responsible for the death and invalidism of mothers as well as the death, blindness and mental and physical impairment of infants The immigrant midwife is herself a dirty, unkempt person living in a squalid tenement." See Carolyn C Van Blarcom, "Midwives in America," *Amer J Public Health*, 1914, *4* 198

[19] Richard Wertz and Dorothy Wertz, *Lying-In A History of Childbirth in America* (New York. The Free Press, 1977), pp 146–60

[20] Litoff, *American Midwives*, pp 81–82

[21] Joseph B DeLee, "The prophylactic forceps operation," *Amer J Obstet Gyn.*, 1920, *1* 34–44

[22] Huntington, "Regulation of midwifery," p 84

With this background in mind, the status and practice of midwives in Lawrence, Massachusetts, in the early twentieth century was studied. The primary focus of the investigation was to learn how the midwives and their clients coped with this changing legislation Did the restrictions cause midwives to stop practicing? If not, how did they avoid prosecution? Did they serve only the immigrant community as some have suggested? What kind of relationships did they have with local doctors? Finally, if legal restrictions did not diminish their practice, what did?

This study of midwives in Lawrence is based on data drawn from several distinct sources. Most important are the birth registration records filed with the Lawrence City Clerk between the years 1896 and 1915. Lawrence was chosen as the focus of the study because it fitted the description of an "immigrant city," and its birth records had been kept intact and were made available by a cooperative city clerk. The choice of the years studied was dictated by the information contained in the records of this period. Prior to 1896 birth attendants often did not sign returns and consistent records begin in Lawrence only in that year.[25] In late September 1914, midwives in Lawrence all stopped signing returns as a result of the prosecution of several of them.[26] Returns through 1915 were analyzed to get a sense of the midwives' practice after they stopped signing returns, but empirical analysis is complete only through 30 September 1914.

The number of births attended by each midwife and each doctor in every year was recorded. As a result of limited resources, complete information from all 30,000 birth returns in this period could not be coded. Only in selected years—1896, 1900, 1905, 1910, 1914—was more information gathered, and when doctors attended, only the birthplace of the parents was noted. However, in the case of midwives attending in those years, the following information was coded: child's sex and name, father's name and mother's maiden name, address of parents, birth place of each parent, occupation of the father and, in 1914, ages of each parent, occupation of mother and the ward of Lawrence in which the birth took place. Complete information was also gathered on each midwife's deliveries in her first year and, when possible, the date of each midwife's first and last recorded delivery was identified. While more complete data is desirable, overall the study is based on the examination of over 30,000 individual records, and almost 3,000 coded midwife returns.

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[23] Walter Burrage, *A History of the Massachusetts Medical Society, 1789–1922* (Norwood, Massachusetts Plimpton Press, 1923), p 255

[24] *Ibid*

[25] Some signed records from 1892–93 were found but these were not consistently recorded.

[26] Starting in October of 1914 and continuing through May of 1915, most of the major Lawrence midwives were prosecuted for "practicing medicine without a license" All pleaded guilty and were fined $100

In 1913, Lawrence began to undertake a census of births in the city. In the first few weeks of a year, canvassers visited every household in the city and recorded any births in that family in the previous year. The canvasser's cards were then matched to the birth return slips. These records were valuable in two ways. First, they filled in apparent gaps in the birth returns with approximately 100–200 births recorded each year that were not covered by the returns. Second, when midwives stopped signing returns, the canvasser's card provided a clue to their continued practice. For example, a birth return would be signed by a doctor who noted that he had not personally attended the birth, while the corresponding canvasser's card would list the attendant as one of the midwives. This discrepancy was probably the result of parents, perhaps unaware of the legal situation faced by midwives, candidly responding to the canvasser's question of who attended the birth. When the census cards and birth returns were later collated, the midwife's name would frequently be crossed out or erased and the doctor's name inserted. Also, on occasion, the census card would indicate two attendants, such as "Mrs. Riehm and Dr. Birmingham." This information enabled the authors to get a sense of the relationship between various doctors and midwives. The canvasser's cards by 1918 seldom noted midwives' deliveries, although interviews suggest that some women continued to practice for two more decades. The change in 1918 may have indicated a decline in midwife activity or simply a change in data collection procedures by the canvassers. Therefore, while the canvasser's cards will be used in certain cases, primary empirical analysis will focus on the period between 1896 and 1914 when more data is available.

Since all of the midwives who attended births in Lawrence have been dead for at least twenty years, the best source of information concerning the informal side of their practice was interviews with their relatives, friends, acquaintances and clients. These people were traced through an examination of the midwives' death records, obituaries and various marriage and birth records. Those contacted were sent a questionnaire and, when possible, interviewed. The same process was used to trace the relatives of important doctors. Also, the local newspapers from 1890–1915 that were available on microfilm were examined and records of midwives' and doctors' advertising were made.[27] Finally, the data on population and immigration was drawn from United States Census records and the annual reports of state births.[28]

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[27] The *Evening Tribune* was the primary newspaper studied for this period.

[28] Secretary of the Commonwealth of Massachusetts, *Annual Reports of Births, Marriages and Deaths in the Commonwealth*, Public Document No 1 (Boston State Printers, 1860–1930) These will be cited hereafter

Before examining the impact of the Porn decision on the midwives of Lawrence, it is important to understand why the setting of this study so aptly fitted the description of an immigrant city. Lawrence, Massachusetts, was chartered in 1847 as a six-square-mile planned mill community on the Merrimack River twenty-five miles north of Boston. Founded as a model town by Abbott Lawrence, the community soon flourished, and by 1850 the population was 6,000, most of whom were mill workers drawn from the New England states. They had the services of a library, eleven schools and a dozen doctors, all provided under the paternalistic arrangements of the mill owners.[29]

The character of the city changed as the labor supply was drawn in greater numbers from Europe. The first wave of immigrants consisted of Irish families in the 1850s and 1860s. Changes were particularly rapid in the city from 1890–1910 when Germans, Russians, Italians, Turks and Poles moved there (see Table 1). In 1890, the city population was 44,654; by 1915, it had grown to 90,259 with 45.8 percent of the population being foreign born.[30] While the birth rate changed little in this period, by 1915 the rapidly increasing population resulted in a doubling of the number of births in the city to 2,948.

By the turn of the century the city was hardly a model community as it now had a large, poor, overcrowded, generally illiterate population. Relations between laborers and mill owners were continually strained as the workers sought to organize into unions. The culmination of this tension was a strike in 1912 which drew national attention to Lawrence as a symbol of both the struggle faced by immigrants and the bitterness of union-management disputes nationally.[31] It was in this setting that the midwives worked, in many cases renewing a practice they had established in another country, and which had been interrupted when they joined their husbands who sought a better life in the mills of Lawrence.

Figure 1 illustrates the proportion of recorded births attended by midwives, male doctors and female doctors. It suggests why physicians felt so threatened by midwives that Hanna Porn was taken to court. In 1903, male doctors attended 67.6 percent of all births in Lawrence, but by 1908 the figure had dropped to 56.5 percent. Even more striking is the consistency of the gains made by midwives, who more than doubled the proportion of

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as *Births, Marriages and Deaths* The total births for Lawrence listed in these volumes are typically higher than the number of birth registration sheets remaining in the Lawrence Clerk's office This is partly the result of the state totals being drawn from the summary birth registration books which have a number of entries made after the end of the calendar year It also probably reflects a loss of some sheets—a problem largely rectified with the initiation of the birth canvass Also an examination of ethnicity suggests that there was no systematic bias in the data.

[29] Donald Cole, *Immigrant City Lawrence, Massachusetts, 1845–1921* (Chapel Hill University of North Carolina Press, 1963), pp 17–26

[30] *Ibid*, p 209

[31] *Ibid*, pp 1–13, 177–94 See also William Cahn, *Lawrence 1912 The Bread and Roses Strike* (New York Pilgrim Press, 1977)

Table 1 Immigration Into Lawrence, 1890–1910

Year	Total Population	Nativity							
		Ireland	England	Canada	Germany	Russia	France	Italy	Turkey
1890	44,654	7,697	4,985	4,459	1,830	60	0	46	5
1895	52,164	7,487	5,486	5,665	2,402	426	68	263	213
1900	62,559	7,058	5,131	8,682	2,465	780	147	936	277
1905	70,050	6,557	5,153	7,597	2,388	1,297	435	2,804	1,332
1910	85,892	5,943	5,659	9,498	2,301	4,366	788	6,693	2,077
Net Change	+41,238	−1,754	+674	+5,039	+471	+4,306	+788	+6,647	+2,072

Source. Derived from Donald Cole, *Immigrant City* (Chapel Hill. University of North Carolina Press, 1963), p. 209

births they attended between 1900 and 1908 from 19.9 percent to 41.3 percent Female doctors played a small role in this period, except between 1898 and 1901. Their activity in those years was primarily the result of the arrival of one woman—Johanna Koehler. Dr. Koehler personally accounted for 60 percent of the 813 deliveries attended by six different female doctors in those four years. After Dr. Koehler's departure in 1902, female doctors attended, on the average, only about one in thirty births in the city. In 1914 this dropped to a low of attendance at 0.6 percent of all births.

Figure 1 also makes clear the limited immediate effect of the Porn decision of 1907. Seven years after the decision, midwives were still attending 40 percent of the deliveries in the city and *signing the birth returns* in clear violation of the law. In another sense, however, the outcome of the Porn case may well have had an effect The steady growth in the number of midwife deliveries stopped after 1908, though other factors, discussed below, also influenced that change. Overall, however, figure 1 clearly illustrates that the legal campaign to drive out the midwives was only partially successful at the outset As contemporary opponents of midwives noted, legislation alone was not sufficient to stop immediately midwives' practice in Lawrence or in similar communities.[32]

Another factor that probably concerned opponents was the growing number of midwives in Lawrence and the changing nature of their practice. If midwifery practice in a community was limited to one or two women, they could be singled out for special sanctions or attention[33] However, if there were greater numbers of midwives, it was more difficult to control them and there was greater public support for their activities. In 1896, there were 327 midwife-attended deliveries in Lawrence One woman, Louise Beck, was responsible for all of these. By 1913, there were more than a dozen active midwives attending almost 100 births a month with the busiest woman, Minnie Riehm, accounting for only 18 percent of all midwife deliveries.[34] Therefore, the opponents of midwifery could not succeed by shutting down the practice of even the most prominent midwife in the city. The fact that there were a number of midwives practicing is important to keep in mind as the reasons why the proportion of midwife-attended births remained so high are examined.

Midwifery in Lawrence continued for a number of reasons including the immigrant nature of the population, the lack of a hospital providing obstet-

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[32] For example, in a 1909 study of five Massachusetts cities, Huntington found that 15 percent of all births were attended by midwives, and argued for the public education campaign described above See Huntington, "Regulation of midwifery," p 86

[33] Roger W Cobb and Charles D Elder, *Participation in American Politics The Dynamics of Agenda-Building* (Boston. Allyn & Bacon; paperback, Baltimore The Johns Hopkins University Press, 1972), pp 124–29

[34] Lawrence City Clerk, Birth Registration Sheets, 1913 Physician obstetrical practice was also decentralized In 1913, there were forty-one physicians, as opposed to twelve in 1896, who attended at least ten births They averaged about 140 deliveries a month with the busiest physician, Dr. Alphonse Riopelle, attending 14 percent of all physician deliveries

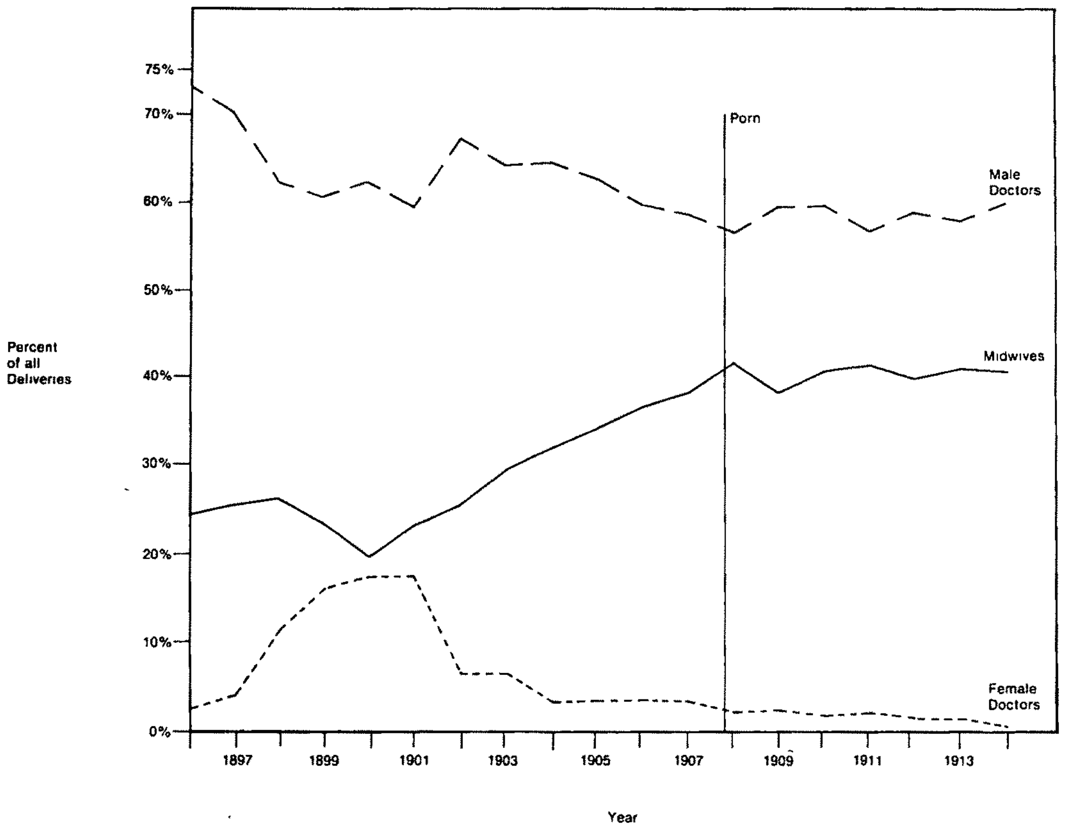

Figure 1 Percent Distribution of Recorded Deliveries in Lawrence, 1896–1914

rical care, the quality of the care provided at limited cost by the midwives, their use of advertising and finally, when the laws were more rigorously enforced, the midwives' ability to circumvent them. Of these factors, the most important was the immigrant nature of Lawrence's population. The relationship between immigration and midwifery was apparent to some midwife critics, such as Dr. Ira Wile, who noted that: "the interrelation of immigration and midwifery may not seem patent at first glance. A moment's thought, however, will show that in the problems relating to the restriction of immigration and the restriction of midwifery there are many points in common."[35] In Lawrence, between 1896 and 1914, the proportion of births to immigrants to total births was never less than 81.8 percent and was as high as 86.2 percent in 1909.[36] More important, as noted earlier (see Table 1), the immigrants in Lawrence at this time were primarily from Southern and Eastern Europe where, as Wile pointed out, "... the midwife exists as an established institution."[37] While English, Irish, and Canadian immigrants accounted for 84 percent of the total foreign-born Lawrence population in 1890, by 1910 they made up only 51 percent of all immigrants in the city.[38] Van Blarcom was prophetic when she stated:

> The desire of foreign women to employ midwives and the determination of midwives to be employed is so strong that even were midwives legislated out of existence they would still be called in by expectant mothers (and) among the Italians the husbands of the expectant mothers will seldom permit a physician or "man midwife" to be employed.[39]

Also, among those moving into the city were many women with formal training and established practices overseas who expected to continue their professional activities in their new home. In contrast, the ethnic groups already in the city had generally relied on doctors of their own nationality to deliver their babies. This was particularly true for Canadian mothers.[40]

Of the three active midwives in the city in 1900, two were generalists in terms of the ethnic groups they served while the third—Ann Curran—was a specialist. Almost all of the forty-two births she attended were either to women born in Ireland (thirty-one) or women born in the United States with Irish maiden names. The other two active midwives, Hedwig Himmer and Minnie Riehm, served a heterogeneous mix of women from Italy, Ireland, Poland, Germany and England. Five years later, the situation had changed considerably. In 1900, births to Canadian mothers accounted for almost one-third of all births in the city and those to Italian mothers one-twentieth. By 1905, the proportion of births in the city to Canadian mothers dropped to one-fourth while births to Italian mothers now numbered over 200 or one-eighth of all city births. It should also be noted that these Italian mothers relied almost exclusively on midwives, most notably, Angelina Lopiano (120 of 122 deliveries to Italian mothers), Serafina Isabella (36 of 38 deliveries) and the ubiquitous Minnie Riehm (37 of 192 deliveries). There was also a midwife who served only Syrian mothers and yet another whose clients were all Portuguese.

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[35] Ira S Wile, "Immigration and the midwife problem," *Boston Med Surg J*, 1912, *167* 113

[36] *Births, Marriages and Deaths*, 1910, vol 68

[37] Wile, "Immigration and the midwife problem," p 113

[38] Cole, *Immigrant City*, p 209

[39] Van Blarcom, "Midwives in America," p 203

[40] For example, in 1900, 95 percent of births to Canadian mothers were attended by five doctors, primarily Omer Routhier (160), A J Riopelle (126) and Alphonse Petit (52) Likewise all but eighteen of the almost 400 deliveries attended by these five doctors were either to mothers born in Canada or women whose husbands were Canadian Only nine births to Canadian mothers were attended by midwives

As these new immigrant groups moved into the city, they apparently were not deterred by, and perhaps were even unaware of, the legislative and court battles being waged in Boston. It is also noteworthy that as late as 1907 there were no Italian doctors in Lawrence attending births, and they did not become involved in more than a handful of births until 1914. An examination of city directories reveals that the two doctors who were most active in delivering babies after the midwives stopped signing returns did not appear in any directory until 1905 (Dr. Joseph Sinclitico) and 1909 (Dr. Constant Calitri).[41] Hence, when the first wave of Italian immigrants arrived in Lawrence at the turn of the century they not only brought with them a preference for midwives but they also found few Italian doctors to serve them. Therefore, a cultural preference for midwives in certain key ethnic groups and a dearth of doctors to serve these populations combined to provide a major impetus for continued midwifery practice in the city.[42]

A second factor contributing to the popularity of the midwives was the lack of opportunity to give birth in a hospital. Although much of the effort of the "reformers" of midwifery legislation was aimed at moving birth from the home to the hospital, this was not possible in Lawrence.[43] Lawrence in this period had only one major hospital. The Lawrence General Hospital had opened in 1875, but it was not until 1903 that the city records note a birth there, and it was 1911 before the hospital first recorded one hundred births in a single year. In 1913 there were 145 deliveries at Lawrence General and twenty-three more at two smaller hospitals, accounting for 6 percent of all births in the city. Four midwives and one physician had more home deliveries individually that year. The overwhelming majority of Lawrence physicians attended only home births prior to 1915. By 1920, however, obstetrical practice at the hospital had increased to 354 births or about one out of every eight in the city. The births were attended by a variety of doctors though certain ethnic groups, notably Italians and Canadians, still gave birth almost exclusively at home.[44]

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[41] *The Lawrence Directory* (Boston. Sampson & Murdock), annual editions from 1900 to 1910

[42] For a more complete study of the relationship between midwifery practice and ethnicity in Lawrence, see Eugene Declercq and Richard Lacroix, "The Politics and Sociology of Immigrant Midwifery Practice in Lawrence, Massachusetts," a paper presented at the annual meeting of the Organization of American Historians, Cincinnati, Ohio, April 1983

[43] Wertz and Wertz, *Lying-In*, pp 132–77

A third factor working on behalf of the midwives was that many of them did not fit the dire images drawn of them by their adversaries. The busiest of the midwives in Lawrence were all literate, had specialized education, and were apparently concerned about hygiene. Many had been trained in Europe where, as an article in the *Journal of the American Medical Association* noted, "They are admitted to lying in asylums for poor women and are taught cleanliness and the physiology of labor theoretically as well as practically."[45] For example, Louise Beck had graduated from the "principal school of obstetrics" in Germany, Hedwig Himmer from the Royal School of Obstetrics in Dresden, Serafina Isabella from the Clinica Obstetrica in Naples and Virginia Pedrazzini from the University of Milan. Some of the midwives received their training in the United States with Minnie Riehm (New York School of Midwifery) the most prominent example.[46] In addition, the midwives were often members of various social and religious groups in the city and, in serveral cases, their spouses were also prominent men in the community.

A fourth incentive for the use of midwives was financial. The standard cost for midwifery services was five dollars for which a mother often received, "... attendance at confinement, simple nursing care, help in the household duties and general nursing and oversight of the home until such time as she is able to resume her work."[47] Daily checkups from midwives for eight to ten days were common, while physicians would usually limit themselves to one or two postpartum visits. Of equal importance to some of those interviewed was the fact that most midwives would accept payment in kind such as food and services, while doctors usually wanted to be paid their ten dollar fee in cash. Flexible payments of this type were important since the average mill worker in Lawrence in 1912 made eight dollars and seventy-six cents for working a fifty-four hour week.[48]

Another reason why midwives retained their prominence was advertising. At almost no time between 1896 and 1911 did a daily edition of the *Lawrence Evening Tribune* appear without an advertisement for at least one midwife in it. Louise Beck, Minnie Riehm, and Hedwig Himmer advertised most frequently. With the exception of Serafina Isabella, the Italian midwives never advertised in the *Tribune,* perhaps either relying on informal communication networks or a more specialized Italian newspaper. The *Tribune* advertisements were generally straightforward and were quite similar to those used by physicians at the time. In fact, several of the midwives, including Hedwig Himmer, referred to themselves as doctors.[49] Minnie Riehm, for most of her eight years of advertising, also stated that she was a "successor to Louise Beck," which she was, quite literally. The last advertisement for Louise Beck appeared on 8 May 1899 (her last recorded delivery in Lawrence was on 11 May before she moved to Paterson, New Jersey), followed the next day by a "successor" advertisement for Mrs. Riehm who even lived at the same address that Mrs. Beck had. This use of advertising continued after the Porn decision but only by Mrs. Himmer. Minnie Riehm's final advertisement appeared on 7 May 1907 and a month later Serafina Isabella's last advertisement was published. Mrs. Himmer continued running advertisements until 3 June 1911, but under the category of doctors.

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[44] Thomas Leavitt, *Mill Owners and Missionaries A History of the Lawrence General Hospital* (Lawrence Lawrence General Hospital, 1975), pp 1–28 See also City of Lawrence, Birth Registration Summary Volumes, 1900–1930, City Hall, Lawrence, Massachusetts

[45] "Supervision of midwives," *JAMA,* 1907, *48* 712

[46] This information was drawn from the midwives' obituaries, their advertisements, and interviews with their descendants

[47] S Josephine Baker, "The function of the midwife," *Women's Med J*, 1913, *23* 197

[48] U S , Congress, Senate, *Report on Strike of Textile Workers in Lawrence, Massachusetts, 1912* Prepared under Charles P Neill, Commissioner of Labor 62nd Cong , 2nd Sess , 1912, Document #870, p 72

Finally, when pressure from some physicians forced the midwives to be less conspicuous, they adopted several tactics which allowed them to continue their practice. As noted earlier, in 1911 and 1912 a change on birth registration forms was gradually implemented. A line was added which read, "I did (doctor's name) personally attend this birth." This was a means used to identify those doctors who might be aiding midwives and, indeed, in some cases most of a doctor's birth returns would involve deliveries he did not attend. The fact that midwives attended the mothers involved in these cases is based on evidence drawn from the canvasser's census cards attached to the birth returns. There were references to virtually all midwives on the canvasser's cards even after they had stopped signing birth returns in 1914. In many cases, a midwife appears in conjunction with a doctor. However, from examining the records, the exact nature of the relationship between the midwives and the physicians is unclear.

There were apparently two strategies used by midwives in these cases. In some instances, midwives working with a cooperative physician would deliver the baby and the doctor would later check on the mother and complete the birth return. According to the descendants of several of the midwives, several doctors agreed to these informal cooperative relationships. In other cases, involving less friendly doctors, the midwives would attend the birth, clean up and leave, and have the parents get in touch with a doctor. According to one physician from that era, it was this practice that led him to contact state authorities in an unsuccessful attempt to have several midwives arrested in the early 1920s.[50]

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[49] The first "doctor" advertisement for Hedwig Himmer appeared on 4 June 1902 in the *Evening Tribune*, p. 7 and similar ads ran until 3 June 1911. The text of Himmer's advertisement was as follows "Dr H Himmer, Midwife, 190 Park St., Lawrence Graduate from the Royal School of Obstetrics at Dresden, Germany I am prepared to respond to all calls made upon me Telephone 740-11," *Lawrence Evening Tribune*, 5 January 1905 Serafina Isabella's advertisement referred to her as a "Lady Physician and Midwife" and noted that she was bilingual and responded to calls at all hours while charging five dollars for eight to ten days' attendance, *Lawrence Evening Tribune*, 4 January 1904

[50] Interviews with Dr N F. Decesare and descendants of midwives Angelina Lopiano, Elena Stella, Concetta Leonardi, Virginia Pedrazzani, Angelina DeMarco and Paola Leone

A careful examination of birth records revealed another strategy adopted by certain midwives: having fathers complete birth returns and sign as attendants. Prior to 30 September 1914, the proportion of birth returns signed by fathers was never greater than 1 percent. In the final three months of 1914, it was almost 5 percent. However, the assumption of midwives' involvement was based on more than inference. Canvasser's cards attached to birth returns signed by fathers frequently listed midwives as the attendant. The midwife most commonly cited in this regard was Minnie Riehm.

It might appear from the above discussion that the midwives were organized in some formal or informal relationship. Interviews with their descendants and analysis of the dates of births attended by midwives indicate that relations between the midwives were cordial at best. There was no formal organization of midwives and no evidence to suggest that, for example, one midwife might cover for another on vacation. It appears that some of the busiest midwives never took a vacation since no clear break in the dates of their deliveries occurs. Even within ethnic groups, the relationships between midwives appear complex with factors such as birthplace within a country, neighborhood and training all playing a role. For example, most of the Italian midwives were divided into Sicilians and Neapolitans, which in turn influenced the area of the city in which they lived and, therefore, practiced.[51]

Eventually, the combination of legal restrictions, physicians' opposition, the greater influx of foreign-born doctors, the rise in hospital births, the passage of restrictions on immigration in the 1920s, and the assimilation of immigrants resulted in the diminution of midwifery practice. By the late 1920s midwives were the attendants at only a small fraction of the births in the city. Interviews with their descendants, however, indicate that several of the midwives continued to practice into the 1930s. Also, in the *Lawrence Directory,* in the listing of nurses, Angelina DeMarco (1933), Concetta Leonardi (1938) and Angelina Lopiano (1938) continued to have the word midwife added after their name well into the 1930s.[52] By this time, their practice was limited primarily to family and friends.

Overall, this research has shown that changes in the legal restrictions regulating midwifery practice had little immediate impact on the activities of midwives in Lawrence, Massachusetts. For at least seven years after supposedly being legislated out of existence, midwives continued to practice openly in the city and, for some time after, practiced surreptitiously. The factors that enabled them to continue practicing despite the legal changes were primarily the immigrant nature of the population, the midwife's own skill and standing in the community, their minimal fees in a working-class community, and their ability to circumvent the statutes, often with the help of cooperative physicians. As conditions changed, most notably with the arrival of doctors who were also immigrants and who did not cooperate with midwives, the law became a larger barrier for the midwives. In essence, the first thrust of the campaign against midwifery—legal changes—served as a necessary, but clearly not a sufficient, condition to eliminate midwifery practice Eventually, by 1940, as limits on immigration cut down the flow of newcomers who supported the midwives, midwifery practice in Lawrence largely disappeared.

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[51] *Ibid*

[52] *The Lawrence Directory,* annual editions from 1933 to 1938

MEDICO-HISTORICAL NEWS AND ACTIVITIES

CORRESPONDENCE AND REPORTS

APPOINTMENTS IN THE HISTORY OF MEDICINE

University of California, San Francisco. Guenter B. Risse has been appointed Professor and Chairman of the Department of the History and Philosophy of Health Sciences at the University of California, San Francisco, School of Medicine, from 1 July 1985. A native of Argentina where he received his M.D. degree in 1958 from the University of Buenos Aires, Dr. Risse came to the United States in 1959 and completed a rotating internship and three years of residency in internal medicine. He then returned to the classroom and under the guidance of Lester S. King obtained an M.A. in 1966 and a Ph.D. degree in 1971, both from the History Department of the University of Chicago. The title of his Ph.D. dissertation was "The History of John Brown's Medical System in Germany During the Years 1790–1806."

After a brief period at the University of Minnesota, Dr. Risse took up a position in 1971 in the Department of the History of Medicine at the University of Wisconsin-Madison. As chairman he reorganized and then expanded the Department. The following year he was appointed a member of the History of Science Department and the History Department. He was promoted to full professor in 1976. He also became affiliated with the Ibero-American Studies Program at Madison.

Dr. Risse's background has led to many contacts with medical historians throughout the world; some sponsored by the World Health Organization. He was elected to membership in the International Academy of the History of Medicine in 1977 and is a corresponding member of a number of foreign societies devoted to the history of medicine and science. From 1979 to 1982 he was the book review editor of *Clio Medica*.

Dr. Risse has written on a variety of topics ranging from ancient Egyptian healing to twentieth-century bloodletting. A number of his articles deal with eighteenth-century subjects, as does his book, *Hospital Life in Enlightenment Scotland: Care and Teaching at the Royal Infirmary of Edinburgh*, scheduled to appear later this year from Cambridge University Press. In 1974, Dr. Risse edited and translated Karl Rothschuh's *History of Physiology* and he has also edited books on home health care in America and Chinese medicine.

At UC-San Francisco, Dr. Risse expects to maintain his commitment to the teaching of medical students while at the same time building a strong graduate program in alliance with his colleagues at the Health Center and across the bay in Berkeley.

National Library of Medicine. Philip M. Teigen has been appointed Deputy Chief of the History of Medicine Division, National Library of Medicine, Bethesda, Maryland, from January 1985. Dr. Teigen was born in Chicago and received his B.S. from the University of Minnesota in 1964. He studied for his graduate degrees at the University of Wisconsin, receiving his M.S. in 1969 and his Ph.D. in history of science in 1976. His dissertation was entitled "Richard Seymer's Golden Workes of Phisicke and Surgery (ca. 1576): An Edition with Introduction and Glossary."

In 1974, Dr. Teigen was appointed history of medicine librarian at the Osler Library at McGill University and in 1979 he became Osler Librarian. Dr. Teigen also held appointments as lecturer (1976) and then assistant professor (1982) in the Department of Humanities and Social Studies in Medicine at McGill.

Dr. Teigen edited *Books, Manuscripts, and the History of Medicine* (New York, 1982) and is the co-author of *The Osler Library* (Montreal, 1979). He has written a number of articles relating to his research interests. He is working in three areas at present: materia medica and the Galenic theory of drugs in the Renaissance, John Locke's medical and scientific notebooks, and nineteenth-century veterinary education in Canada and the United States.

In his new position at the National Library of Medicine, Dr. Teigen will work with the Chief, John Parascandola, to develop and make known to scholars the History of Medicine Division's fine collection of books, manuscripts and pictures.

KARL EDUARD ROTHSCHUH (1908–1984)

A few months ago an internationally known figure in the field of the history of medicine died: Karl E. Rothschuh, emeritus professor of medical history and former director of the Institute for the History and Theory of Medicine at the University of Muenster, West Germany. Born in Aachen, on 6 July 1908, Rothschuh first set out to study the agricultural sciences before changing to medicine. He completed his medical studies at the University of Berlin in 1936. His early interest in theoretical and historical medical issues was fostered by Paul Diepgen and Julius Schuster, resulting in a dissertation published under the title *Theoretische Biologie und Medizin* (1936).

Rothschuh's career took another turn when he joined the Physiological Institute at the University of Muenster, where he quickly mastered the skills necessary to carry out research, particularly on cardiac electrophysiology After World War II, and a brief sojourn in Wuerzburg, Rothschuh returned to Muenster In 1957 he began teaching the history of medicine, and gradually he built one of the most active German institutes devoted to research and study in this field He retired in 1973, but he continued to work actively, publishing his comprehensive work *Konzepte der Medizin in Vergangenheit und Gegenwart* (1978) and a number of articles.

English-speaking historians will be familiar with Rothschuh's *History of Physiology* which I had the privilege of translating and editing in 1974 This book, a revision of an earlier German version published in 1953, provides an overview of developments in one of Rothschuh's fields of historical interest and is embellished with many diagrams and charts. Especially noteworthy is the representation of prominent scientists as disciples of certain famous individuals. Although not a historian by training, Rothschuh exemplified the reflective medical scientist who becomes deeply interested in the roots of his profession and brings his ample expertise to bear on fostering a greater understanding of the inner transformations of medical thought and their impact on methodology and practice His great personal warmth and modesty made him an attractive teacher and mentor for a whole generation of students.

GUENTER B. RISSE

ANNOUNCEMENTS

NATIONAL NEWS

American Institute of the History of Pharmacy. Alex Berman has been elected Honorary President of the Institute for the 1985–87 term. A distinguished historian of pharmacy, Dr. Berman retired in 1974 from the Department of Historical and Social Studies in Pharmacy of the University of Cincinnati.

American Philosophical Society. A guide to the Society's manuscript holdings in the history of medicine is now available The twenty-five-page listing gives brief descriptions of the materials, noting the size and scope of each collection. Free copies may be obtained on request from Mr. Stephen Catlett, Manuscripts Librarian, The Library, American Philosophical Society, 105 South Fifth Street, Philadelphia, Pennsylvania 19106

Barnard-Millington Symposium on Southern Science and Medicine. This year's symposium dealt with "Images of Nurses in the South" and was coordinated by Ann J. Abadie and Lou F. Moore. It took place at the Education and Research Center of the University of Mississippi in Jackson on 25–27 March The following papers were presented: "Mother, Servant, Saint· Historical Images of the Southern Nurse," Joanne V Hawks (Moderator: Faye Anderson), "Images of Nurses in Southern Literature," Anne Goodwyn Jones (Moderator· Glenn W Watts); "Women as Folk Healers," William Ferris; "The Southern Midwife," Lucie R. Bridgforth; "The Role of the Southern Nurse in Public Health," Edna Roberts, "History of Mississippi Nurses' Association," Ralph Jackson Jones; "History of Nursing Education in Mississippi," Reita Keyes; and "The Southern Nurse Yesterday, Today and Tomorrow," Linda Nauright (Moderator Minta Uzodinma)

College of Physicians of Philadelphia. The Library of the College of Physicians of Philadelphia announces the appointment of Thomas Horrocks as Head of the Historical Department Mr. Horrocks received his bachelor's degree in history from Villanova University and his M.L.S from Drexel University He has previously worked with the Charles Darwin Collection at the American Philosophical Society and, with Dr Whitfield Bell, on the history of the College's second century

Columbia University. The eighth annual history of health sciences lecture series held in the Hammer Health Sciences Center of Columbia University featured the following papers: 18 October, "Malignant Hyperthermia: Then and Now," Werner Kalow and John F. Ryan, 31 January, "Nurse Ratched Revisited: Historical Perspectives on Psychiatric Nursing," Nancy Tomes, 13 March, "Giuseppe Baronio and the First Experimental Skin Grafting," Robert M. Goldwyn, and 10 April, "Toward a Social History of Patienthood," Sheila M Rothman and David Rothman. The series is sponsored by the Health Sciences Library and various departments of the University.

Dumbarton Oaks. The proceedings of the 1979 Dumbarton Oaks conference have now been published in a volume edited by Elizabeth H Boone and entitled *Ritual Human Sacrifice in Mesoamerica* Among the contents, "Maya Heart Sacrifice: Cultural Perspective and Surgical Technique," by Francis Robicsek and Donald Hales, should be of interest to the medical historian The book may be obtained from Dumbarton Oaks, 1703 32nd Street, Washington, D.C. 20007

Johns Hopkins University Institute of the History of Medicine. The colloquium series of the Institute of the History of Medicine had the following presentations in the spring· 21 February, "Military Mortality in Tropical Climates in the Nineteenth Century," Philip Curtin (Johns Hopkins University); 21 March, "The Spread of Epidemic Asiatic Cholera from India 1817 or Earlier?" John Norris (University of British Columbia), 25 April, "From the Patient's Point of View. The Body, Sickness and Health in the Letters of Liselotte von der Pfalz (1652–1722)," Elborg Forster; 9 May, "Puritan and Anglican Perceptions of Illness in Seventeenth-Century England," Andrew Wear (University of Aberdeen, Scotland); and 30 May, "Soldier's Heart," Joel Howell (University of Michigan). The John J. Gilbride Memorial Lecture was delivered by Saul Benison of the University of Cincinnati on 1 March 1985 Dr Benison discussed "The Role of Experimental Surgery in the Development of Walter B Cannon's Early Physiological Thought" On 3 April 1985, the Institute sponsored a lecture by Peter Ostwald of the Department of Psychiatry of the University of California, San Francisco, on "Johannes Brahms. Music, Loneliness, and Altruism"

Joint Atlantic Seminar in the History of Biology and Medicine. The seminar was held at the Institute for the History and Philosophy of Science and Technology, Victoria College, University of Toronto, on 19–20 April 1985. The program included the following speakers. Adel A. Zindat, "The Missionary Hospitals in Jordan, 1900–1950", David P Adams, "Trends in the Historiography of Penicillin· Progress and Prospects", Lynn Nyhart, "German Morphology and Experimentalism Hermann Braus and the Problem of the Extremities"; W Paul Fayter, "Huxley, Politics, and Natural

Theology"; Robert J O'Hara, "Diagrammatic Classifications of Birds, 1820–1900 A Contribution to the Study of Nineteenth-Century Systematic Theory", R. Julian Martin, "The Royal College of Physicians and Dr. John Freind's *History of Physick* (1725–26)"; and Michael Aaron Dennis, "Seeing is Believing· The Illustration of Understanding in Robert Hooke's *Micrographia* "

McLean Hospital Archives. The archival holdings of this leading psychiatric center for treatment, teaching and research are described in the *Guide to the Archives of the McLean Hospital Corporation,* recently published with the assistance of a grant from the National Historical Publications and Records Commission The guide, which includes a brief history of the institution and its affiliated nursing school, was compiled by the hospital's archivist, Terry A. Bragg, and may be obtained at a cost of $7.25 by writing to him % McLean Hospital, 115 Mill Street, Belmont, Massachusetts 02178.

National Library of Medicine. Thomas S Hall, University Professor of Biology and the History of Science, Emeritus, at Washington University, St. Louis, was appointed as a Special Expert in the History of Medicine Division for the period December 1984 to July 1985 Dr. Hall is doing research on the influence of the physiological ideas of René Descartes (1596–1650) upon modern medicine. While at the library, he also advised the staff on its holdings in the history of physiology, the history of embryology, and the history of other aspects of medical biology.

The History of Medicine Division's series of seminars continued with presentations by Frederick G Meyer of the U S National Arboretum and Martin S. Pernick of the University of Michigan, held on 20 March and 9 April, respectively Dr. Meyer spoke on "Leonhard Fuchs and His Herbal. Salvaging a Large Research Project." Dr. Pernick's topic was "Researching the Early History of Medical Motion Pictures "

New York Hospital-Cornell Medical Center. The History of Psychiatry Section of the Hospital sponsored the following seminars in the spring term 3 April, "The Malleability of Hysterical Forms," Herbert Spiegel and Eric T Carlson; 17 April, "Psychosis and Its Treatment in Boston, 1906–1908," Doris B. Nagel; 1 May, "The Comparative Psychology of the Self," Leon Hankoff, 15 May, "On the History of Hypo-alimentation," Cornelius Clark; 29 May, "The Psychoanalytic Apprenticeship of Ernest Jones, 1908–1913," R. A. Paskauskas; and 12 June, "The Loathly Lady. A Response to Bruno Bettelheim," Barbara Fass Leavy

University of Alabama, Reynolds Historical Library. The medical contributions of the Mayo Brothers were the topic of the sixth annual Reynolds Historical Lecture delivered by John W. Kirklin on 22 February 1985 The lectureship was established to allow individuals of international prominence to present a topic on a historical aspect of the health sciences. The Library also sponsored a seminar entitled "Rural Medical Practice in Alabama after World War II," which was given by J J Kirschenfeld on 24 January.

University of Minnesota. A weekly lecture series sponsored by the Department of the History of Medicine concentrated on the impact of scientific surgery on medicine in the fall 1984. Papers given included: "The Evolution of Surgical Asepsis," Leonard G Wilson; "Theodor Kocher· Pioneer in Thyroid Surgery," Theodor B Grage; "The Development of Surgery for Appendicitis," Leonard G. Wilson, "The Early Surgery of the Mayo Brothers," John M Eyler; "Harvey Cushing and the Physiology of the Pituitary

Gland," James Dorsey; "The Development of Internal Fixation for Fractures," Leonard F. Peltier; "Owen H. Wangensteen, Intestinal Obstruction and Fluid Therapy," Leonard G. Wilson; and "Evarts A. Graham (1883–1957). Protagonist of Change in American Surgery," Peter D Olch (Culpeper Lecture). The winter quarter's lectures covered pediatric medicine and included: "Early Institutions of Child Care in England," C Carlyle Clawson, "The Elucidation of Rheumatic Fever," Leonard G. Wilson, "Fighting for Life: Josephine Baker and the Child Health Movement," John M Eyler; "Hal Downey and the Definition of Infectious Mononucleosis," Jane M. Hult; "Early Works in Pediatric Literature," C. Carlyle Clawson; "Polio Before Salk. The Epidemics and Their Consequences," John M Eyler, "The Prevention of Death from Infantile Diarrhea," Leonard G. Wilson; and "The Development of the Pathological Basis for the Blalock-Taussig Procedure," James H Moller.

PROGRAMS OF MEETINGS

The Johns Hopkins Medical History Club, Baltimore

March 21, 1985· "The Black Death Comes to America," Loren G. Lipson

Mayo Foundation History of Medicine Society, Rochester, Minnesota

April 10, 1985: "Eduard Pernkopf and the Pernkopf Painters," David J. Williams

Section on Medical History of the College of Physicians of Philadelphia

September 19, 1984. "Looking at Early Medical Book Illustration," Christine Ruggere; "Notes on the History of Nitrous Oxide," Elizabeth A. M. Frost

October 17, 1984. "Hippocrates and the Plague," Jody Rubin

December 19, 1984. "Through the Looking Glass· The Lantern Slide Collection of Howard Childs Carpenter," Janet Golden, "The Psychiatric and Medical Problems of Benvenuto Cellini," Samuel B Hadden

Society of Medical History of Chicago

February 5, 1985: "Contraception for Chicagoans: Rachel Yarros vs Herman Bundesen," Patricia Ward

March 5, 1985 "Gustav Mahler. A Rendezvous in Streptococcus," James L. Franklin, "Rockford Memorial Hospital," James Monahan

University of Virginia Medical History Society, Charlottesville

February 13, 1985: "Yellow Fever· A Stimulus for Health Care in Belize, Central America," Eleanor K. Herrmann

March 21, 1985. "Blue Ridge Hospital: Demonstration of the Past Influence on the Present," James S. Kennan

April 22, 1985: "Pesthouse, Infirmary, Hospital: A Short Discourse on Hospital History," Dieter H. M. Groschel

Washington Society for the History of Medicine, Bethesda, Maryland

March 21, 1985· " 'The Black Stork'· An American Motion Picture Advocating Euthanasia of Deformed Newborns, 1916–1927," Martin S. Pernick

NEWS FROM ABROAD

Belgium. The Erasmus Foundation of the Free University of Brussels Medical School is planning an international symposium on "Art, History, and Antiquity in Rheumatic Diseases," to be held in Brussels on 17–18 April 1986 Topics to be discussed include rheumatic diseases in paleopathology, medical writing, literature and art, the impact of rheumatic diseases on the arts and politics, antiquity of rheumatoid arthritis; history of physical therapy; and the history of anti-inflammatory drugs. For more information, write to Dr. Thierry Appelboom, Division of Rheumatology, Erasmus Foundation, Free University of Brussels, Route de Lennik, 808, B-1070 Brussels, Belgium

Canada. An index to Margaret Dunn, comp., and Mary Baldwin, ed., *A Directory of Medical Archives in Ontario* (reviewed in *Bull. Hist Med,* 1984, *58*· 614–15) has recently been published by the Hannah Institute. It was prepared by Colette Morin and provides a guide to listings by names, places, subjects, institutions, and legislation/commissions. For more information, write to Mrs Sheila Snelgrove, Hannah Institute for the History of Medicine, 14 Prince Arthur Avenue, Suite 101, Toronto, Ontario, Canada M5R 1A9

France. An international colloquium on the history of medieval medicine, sponsored by the Société Orléanaise de l'Histoire de la Médecine, was held at the Centre Jeanne d'Arc in Orléans on 4–5 May 1985. The program was as follows. J. N Biraben, "Epidémies, hygiène et santé publique au moyen âge", John Cule, "Diagnostic et traitement de la lèpre au moyen âge au Pays de Galles", R. Halleux and C Opsomer, "Entre Dioscoride et Paracelse: les drogues minérales dans la pharmacopée médiévale", M. J. Imbault-Huart, "Introduction à la médecine du moyen âge", D Jacquart, "La pratique dans les oeuvres médiévales de la fin du moyen âge", Michel Mollat du Jourdin, "Hygiène, santé et médecine dans les voyages d'exploration du moyen âge et des grandes découvertes"; J. A. Paniagua-Arellano, "Arnau de Vilanova, paradigme de la médecine universitaire médiévale", Regine Pernoud, "Les femmes et la médecine au moyen âge"; M C Pouchelle, "Corps et chirurgie à l'apogée du moyen âge"; L Premuda, "Albert le Grand et la médecine", M. A. Saint-Denis, "Médecine et médecins dans l'Hôtel-Dieu de Laon aux XIIe et XIIIe siècles", A. Segal, "L'instrumentation chirurgicale au moyen âge—apport des manuscrits", E Seidler, "Les enfants et la médecine au moyen âge", and F Vial, M. B. Merlette, R. Paris and R. Rullière, "La matière médicale dans le haut moyen âge: un exemple Laon"

International Society for the History of Medicine. Professor Hans Schadewalt was elected President of the Society during its twenty-ninth congress in Cairo. The new General Secretary is Professor Marie-José Imbault-Huart. The thirtieth congress will be held in Dusseldorf, West Germany, during the week of 31 August-6 September, 1986

Royal Society of Medicine. The topics presented at the spring sessions of the Section of History of Medicine of the Royal Society were as follows: "Nicholas Venette (?1633–1698)· Surgeon and Author of the World's Best-Selling Sex Manual," Roy Porter; "Albucasis: Arabic Surgery in Spain," Ghada Karmi, "Whither Therapeutics: An Enquiry into Drug Use from Historical Principles," Ronald Mann (joint meeting with the Section of Medicine, Experimental Medicine and Therapeutics), "The Anatomical Theatre," Gweneth Whitteridge (Presidental Address)

South Africa. The latest issue of the *Adler Museum Bulletin* (Vol 10, No 3) contains an article entitled "The Mayos: A Historical Vignette" by Thomas E Keys In this piece, Dr. Keys, emeritus professor of the history of medicine and emeritus librarian of the Mayo Foundation, recollects some personal memories of the Mayo brothers

Wellcome Institute for the History of Medicine. The Institute sponsored two symposia in the spring of 1985. The first, on 15 February 1985, was entitled "Medical Fringe and Medical Orthodoxy" and featured the following speakers: Roy Porter, "Before the Fringe"; Ginnie Smith, "The Body of Medical Self-Help Literature"; Jonathan Barry, "Publicity or the Public Good? Presenting Medicine in Eighteenth-Century Bristol"; Michael Neve, "Presenting Medicine in Nineteenth-Century Bristol", Irvine Loudon, "The Vile Race of Quacks with which this Country is Infested", Sydney Holloway, "The Orthodox Fringe: The Pharmacy Act, 1852"; John Harrison, "Early Victorian Radicals and the Fringe: Or Why Should Old Chartists and Owenites Become Mesmerists, Herbalists and Spiritualists?"; and Roger Cooter, "Unity in Diversity: The Struggle for a Holistic History of Alternative Medicine." The topic of the second symposium, held on 26 April, was "Plague in Early Modern Europe " The following papers were presented. Edward Eckert, "Plague in Northwest and Central Europe, 1560–1640 A Constant Presence"; John Henderson, "Epidemics in Early Sixteenth-Century Florence: Government Regulations and the Role of the Fraternity of Misericordia"; Paul Slack, "The Response to Plague in Early Modern England: Public Policies and Their Consequences", William Schupbach, "Pestis Atheniensium: A Classical Tradition in the Seventeenth Century"; Richard Palmer, "Physick for the Sicknesse. Doctors and the Plague in the Early Modern Period", John Alexander, "Reconsiderations on Plague in Early Modern Russia", and Peregrine Horden, "Three Pandemics—A Comparative Approach." An exhibition entitled "The Pest Anatomized Five Centuries of Plague in Western Europe" was mounted at the Wellcome Institute to coincide with this symposium. It will remain on display until 24 May.

Wellcome Museum of the History of Medicine at the Science Museum, London. In 1977, the Wellcome Trustees placed on permanent loan to the Science Museum their large collection of objects dealing with medical history and a selection of them is now on display on two floors of the Science Museum The lower gallery—"Glimpses of Medical History"—gives a general overview of the subject and presents medical milestones from Neolithic times to the present day. Full-size reproductions of a number of scenes are mounted, among them a pharmacy of 1905, a dentist's office of the 1930s, a bacteriological laboratory in 1955, Lister's ward in Glasgow in 1868, a Roman battle casualty, a pharmaceutical laboratory circa 1840, an electrotherapy room in 1905, and a sickroom of the 1870s Models on a smaller scale include representations of a fifteenth-century consultation, trepanning in neolithic times, childbirth in Islam, naval surgery in 1800, and the plague in seventeenth-century Rome. The upper gallery presents medicine in its social and scientific settings and is entitled "The Science and Art of Medicine." It is arranged in chronological order with approximately equal space being devoted to the pre-1800 and post-1800 exhibits and features such objects as medical and surgical instruments, medical coins and medals, materia medica, medical and pharmaceutical glassware and ceramics Among the eighteen different areas covered are medicine in tribal societies, oriental medicine, classical Greek and Roman medicine, Islam, medieval medicine, the scientific revolution, nineteenth-century public health, twentieth-century laboratory medicine, war and expeditions, and world health (emphasizing the Third World)

The Museum's collections, the largest of their kind in the world, total over 125,000 objects. They have been fully catalogued, and are presently being logged on a computer. The collection is still being expanded, with special attention being given to medicine in the last fifty years

BOOK REVIEWS

DANIELLE GOUREVITCH *Le Triangle Hippocratique dans le monde gréco-romain: Le malade, sa maladie et son médecin.* Rome: Ecole Française de Rome, 1984 569 pp.

The Greek physician can be seen as the natural product of Greek society, fulfilling a role determined at an early stage by the needs of that society, which was technologically inventive and in which the demand for craftsmen exceeded the supply This is the source of the respect already accorded in the Homeric poems to the professional, secular, practitioner. At a later stage, Greek doctors were able to buttress this respect by a deft use of other features of Greek culture, notably literacy and its associated intellectualism. Thus originated that methodical professionalism in medicine which was rediscovered at the Renaissance and enshrined in medical education, and which is taken for granted today But in Roman society where indigenous medicine was based on the *familia* or extended family (kin, dependents and slaves) under the care of the autocratic *paterfamilias,* the Greek physician, arriving in the second century B C, was an alien intruder. He was regarded with intense suspicion and even hostility, not least for the very intellectualism which gave medicine its prestige in Greece. These feelings were voiced early by Cato the Censor (234–149 B.C.), that influential figure who did more than any other to articulate the Romans' feelings about what they were and what made them different from Greeks. Danielle Gourevitch, among other things in this rather big book, gives an elegant, acute and often witty demonstration of the elements in Roman society which explain Cato's remarks as, rather than an eccentricity, the expression of a coherent set of attitudes in which he was confident of finding a sympathetic response in his audience. Given the nature of Roman society, the assumption by Cato and his fellow citizens that they could get on without "scientific" medicine should not surprise us. It should, however, remind the historian that the social roles of medicine in distinct societies differ as widely as the societies themselves. Even within the same society there may be differences Thus Gourevitch's discussion of the writings of Varro (first century B C.) on agriculture and estate management suggests that rural medical practice tended to be a function of the needs of the large estate, and that hence the status and role of the rural practitioner (where he existed at all) were very different from those of his urban counterpart. In his turn the urban practitioner was different from what the technological idealism of Greek medical writers might lead us to expect His reflection in Roman literature is often very sinister the figure of the physician-poisoner emerges, with some similarities to the physician-conspirator of sixteenth-century England. This and similar attitudes are abundantly documented by the author They provide an illuminating background to Galen's evaluation of the ideal physician (see Owsei Temkin's *Galenism*), showing that to be something of a paradox in its context.

Approximately one half of Gourevitch's book is devoted to the physician. The other half is concerned with disease, or rather with what might be called instrumental attitudes to disease in the Greco-Roman world Disease might be exploited to gratify the ego, as by Aelius Aristides and others, as a way of evading obligations (Gourevitch here offers a valuable study of attitudes to malingering), or as the occasion of intense and lurid psychodramas. In this last connection Gourevitch has a fascinating discussion of the fashion for suicide, which was serious enough to attract official attention. She provides a detailed study of a particular disease, gout: her findings make a valuable addition to the other striking social aspects of this disease shown by historians. In the Greco-Roman world, gout occasioned a rich literature, including an anonymous Greek verse drama. How did gout come to be a topic for humor? Greco-Roman writers saw little that was funny about it. They compared its effects to those produced by the most sophisticated instruments of torture used in judicial processes, and regarded a life made wretched by prolonged gout as a reasonable motive for suicide. It was no funnier than syphilis was to the sixteenth century or cancer is to us, and it generated a kind of discussion similar to that generated by those diseases Between them, the "savage god" of suicide and the goddess Podagra or Gout make a lurid picture which should be set against Gibbon's celebrated remarks on the felicity of life under the Antonines.

Gourevitch is fully aware of the one-sidedness of the literary evidence to which she is mostly confined It expresses the attitudes of a highly educated, affluent and frequently neurotic class. Gourevitch however can also draw upon inscriptions and legal documents, and she puts us in possession of as much information as we are ever likely to have about Roman perceptions of disease and doctoring.

It is unfortunate that this collection of elegant and interesting studies should be presented to the reader in the repellent carapace of institutional scholarship, which seems calculated to frighten away all but the most resolute classicists. It deserves a wider readership.

Reviewed by IAIN M LONIE, Dunedin, New Zealand.

JURGEN HAMPEL. ***Medizin der Zoroastrier im vorislamischen Iran.*** Husum, West Germany. Matthiesen Verlag, 1982 (Abhandlungen zur Geschichte der Medizin und der Naturwissenschaften, no 45). 142 pp DM39,00 (paperbound).

The present monograph attempts to analyze anew the medicine of the Zoroastrian community in Iran prior to the advent of Islam. This relatively neglected topic is dependent upon fragmentary references in predominantly religious texts. Whereas previous attempts to study the subject have relied upon translations and secondary sources, much of Jurgen Hampel's analysis is based upon linguistic arguments He presents new translations of his own along with transliterations of the pertinent texts, while pointing out the problems and limitations of the sources and the dangers of over-interpretation and anachronistic assumptions. The result is not intended as a definitive assessment of the development and status of pre-Islamic Iranian medicine, but a preliminary examination into some of its central concepts.

Zoroastrian medicine was characterized by a dualism, a physical or somatic aspect and a spiritual or psychic aspect which were always intertwined and interdependent. Zarathustra (Zoroaster) himself (ca. ninth-eighth century B.C.), was both Physician of the Soul and Physician of the Body, and indeed Hampel has offered a reinterpretation of the name Zarathustra in the context of his role as physician-seer. Among the topics having medical significance in the Zoroastrian literature are the cow (*gav-*), which Hampel argues has the symbolic meaning of healthfulness, and *Haoma,* which has the dual use of an intoxicating agent inducing deep religious ecstasy and a medicament for alleviating pain. Hygenic conditions of both the community and the individual and cleansing rituals figured prominently.

In the Zoroastrian sources, the physician was usually identified with the priest; the province of the priest-physician included the health of the body and soul as well as the welfare of the individual and community It was also said that there were five types of physicians. Those who healed by the power of the mind or magic (*mantra*-medicine) were the most important because they could heal without pain. Next in order of desirability were non-operative physicians, who cured with a minimum of intervention, and those who cured with plants Those held in lowest esteem were physicians concerned with women's complaints and those healing with the knife, for their therapy caused the greatest suffering.

Although Hampel outlines the medical sections from a middle-Persian encyclopedia, the *Dēnkard,* which is an important source of information on earlier Zoroastrian practices, the specifics of disease and therapeutics are not his primary concern, nor are the practices of the non-Zoroastrian segments of pre-Islamic Iranian society. Rather, Hampel has produced an important scholarly and stimulating excursus into the general nature of medicine and the function of the Zoroastrian physician-priest in pre-Islamic Iran, to which he has appended a useful glossary of medical terminology

Reviewed by EMILIE SAVAGE-SMITH, Gustave E von Grunebaum Center for Near Eastern Studies, University of California, Los Angeles

DANIELLE GOUREVITCH *Le Mal d'être femme: la femme et la médecine dans la Rome antique.* Paris Société d'Édition "Les Belles Lettres," 1984 276 pp. Ill. F125.

Women of the Roman period are more visible than their Greek counterparts, their lives no longer restricted to the women's quarters of the house, the *gynaikeion.* In *Le Mal d'être femme,* Danielle Gourevitch follows the Roman woman in her sicknesses and in those womanly conditions which come to her by virtue of her womanhood through a varied and thorough collection of passages in French translation, drawn from Roman authors and documentary sources, Soranus, Rufus, and Galen dominate. Roman women attend horse races in the Circus, both to see and to be seen, yet Gourevitch argues in introductory and concluding essays, as well as in discussions of individual passages, that this emancipation is full of contradictions for all Roman women and particularly so for wife and mother Any assessment of that emancipation must be tempered by the fact that medicine for women at Rome continues as an organ pathology, ever "utero-centric," treating the Roman woman so she may fulfill her role as producer, while the concessions medicine makes to accommodate more varied lifestyles serve to isolate her from that role without replacing it.

The focus of the volume is primarily medical, even so, Gourevitch casts her net widely so as to draw in useful paramedical material which will illuminate societal attitudes toward women's conditions Her discussion of the choice of nursing one's own infant, for example, includes not only endorsements by the philosopher Favorinus and the doctor Soranus, and Soranus's accommodations for cases in which nursing is undesirable, either because the mother's milk is inadequate or she wishes to conceive anew, but also Artemidorus's evaluation in his *Interpretation of Dreams* of the dream of holding or seeing a neonate It portends for man or woman griefs and preoccupations difficult to alleviate. Calpurnia, third wife of the younger Pliny, is paradigmatic for Gourevitch's picture of the Roman matron. seen only through the eyes of her husband, Calpurnia is to him young and inexperienced, endangering her life through lack of proper precautions in a first pregnancy He is grieved by the loss of their child and consoles his wife's grandfather with the hope of other children from the marriage because of this first proof of fertility (*Letters* VIII 10). When Pliny notes to his wife's aunt Calpurnia's growing interest in literature, it is his works she reads; she sets his verses to music (*Letters* IV 19). The view of woman as producer, with aspirations which could reach no higher than those of an incomplete male, remains characteristic of Roman society The militaristic bias of that society and its patriarchal structure are large impediments to the development of roles for women other than that of wife and mother, despite greater freedom from restraints; and I am a bit uncomfortable when Gourevitch seems to expect such a development.

Reviewed by ANN ELLIS HANSON, Division of Humanities, Fordham University/Lincoln Center, New York.

JEROME O. NRIAGU ***Lead and Lead Poisoning in Antiquity.*** New York John Wiley & Sons, 1983 (Environmental Science and Technology Series) xiii + 437 pp $49.95.

The purpose of this book is to provide an integrated account of the production and consumption of lead in ancient times. Although other scholars have traced various aspects of the history of lead from antiquity to the modern era, Nriagu has chosen to treat the topic comprehensively from the earliest times to the fall of Rome.

The first five chapters deal in order with early lead lore, ancient military, medicinal and cosmetic uses of lead, mining, metallurgy, production, usage and the principal lead compounds known in antiquity. The oldest known piece of lead, a statue discovered in Turkey, dates from 6500 B.C. The discovery of cupellation about 4000 B.C., the process by which silver can be extracted from base metals such as lead, represented a critical scientific breakthrough comparable to the discovery of fire Even today the recovery of silver during the refining of lead represents a major industrial source of silver. Silver-bearing lead ores were mined extensively mainly for their silver throughout Europe, the Middle East and China Nriagu estimates that the cumulative worldwide production of lead from the earliest times to the fall of the Roman Empire was about 40,000,000 tons The ancients used lead in pewter and other lead-tin alloys such as solder, coinage, glass, glazes and enamels, pipes, and cookware. The principal lead compounds of antiquity were galena (lead sulfide), litharge (lead monoxide), minium (red lead) and ceruse (white lead) White lead (ceruse) has perhaps been the most important lead pigment throughout history. It was easy to produce and basically its production has changed little through the centuries.

These early chapters provide the background for chapter six in which lead exposure and lead poisoning in antiquity are discussed, including the role of lead poisoning in the decline of the Roman Empire Both ceruse and galena (kohl) were used widely as cosmetics throughout the Old World There has been much discussion about the role of lead in drinking water as an important source of lead exposure among the Romans. Nriagu concludes, probably wisely, that this controversy is insoluble because of the differences in plumbisolvency of various waters. He builds a much better case for the importance of contamination of food and beverages, particularly wine, as the major non-occupational source of lead poisoning in Greco-Roman times The Romans did not have cane sugar as a sweetener and so used boiled-down grape juice (*mustum curari*) to sweeten their dishes. All classical authors were agreed on one point; namely, that lead vessels are the best for boiling the must as they made the concentrate sweeter and more durable In this way the syrup was contaminated by lead, a point which has been verified by modern scientists using the Roman recipes for its preparation. It seems likely that wines have been adulterated with lead acetate since prehistoric times Lead also was a common constituent of spices, drugs and elixirs.

Nriagu presents evidence that lead exposure from air, water, wines and food differed substantially among aristocrats, plebians and slaves. While the estimated total exposure of the Roman slave was probably comparable to that of modern Western man, that of the aristocrat, who was often bibulous and gluttonous, was probably at least ten times greater He attributes the difference largely to the aristocrat's greater consumption of more heavily adulterated wines and spices and sweetened foods. His estimates appear reasonable and rather well documented. In the light of modern studies on lead absorption, the estimated lead intake of the aristocrats could well have placed them in the range for showing acute symptomatic lead poisoning and the reproductive and other serious toxic effects of lead The clinical manifestations of lead poisoning, including saturnine gout in Roman aristocrats, were well described in the Greco-Roman medical literature Yet ancient physicians failed to make the link between cause and effect. Indeed, the clinical diagnosis of lead poisoning continues to baffle physicians even today. The infertility of the Roman aristocracy from 50 B.C. onward is chronicled. Nriagu does recognize that many factors may have led to the collapse of the Roman Empire but, nevertheless, he concludes that lead poisoning of the aristocratic oligarchy is implicated as one of the most likely causes of Rome's internal weaknesses

The author has written extensively on metallic contaminants in our modern environment. This book treats lead in antiquity in a scholarly and comprehensive fashion. Nriagu acknowledges his debt to the many scholars who have studied various aspects of the topic. The book is well documented and the bibliography is extensive. It is highly recommended. The reader familiar only with modern lead poisoning could learn much about today's problems from this account of lead in antiquity

Reviewed by J. JULIAN CHISOLM, JR., Department of Pediatrics, The Johns Hopkins University School of Medicine, Baltimore, Maryland

'ALĪ IBN RIDWĀN *Medieval Islamic Medicine: Ibn Riḍwān's Treatise "On the Prevention of Bodily Ills in Egypt."* Translated, with an introduction, by Michael W. Dols Arabic text edited by Adil S Gamal Berkeley-Los Angeles-London· University of California Press, 1984 (Comparative Studies of Health Systems and Medical Care) xv + 186 + 63 (Arabic) pp $35.00.

In the introduction to his treatise, the Cairene physician 'Alī ibn Riḍwān ('AbR), who died in 1061 or a few years later, writes that it was a monograph by his Tunisian colleague Ibn al-Jazzār (died 979 or 980) which provoked his protest Ibn al-Jazzār, discussing the influence of climate upon health, had characterized, it seems (his treatise is not extant), the climate of Egypt as particularly unwholesome and conducive to epidemics. This man, ʿAbR says, lacked both theoretical knowledge and local experience. Fully equipped in both respects, ʿAbR sets out, in fifteen brief chapters, to describe the geographical, climatic, and "ecological" conditions of his home country and its capital and their effects on the six "non-natural" causes of health and sickness, to define the causes of pestilence, and to give general and specific rules for the preservation of bodily health, as well as for improving environmental conditions, in Egypt. While admitting to the great heat and humidity of the country and hence the susceptibility of all its living beings to decay, ʿAbR maintains that the average temperament of the bodies (and characters) of its inhabitants corresponds to that of its environment, and that observing this correspondence will preserve, or restore, the bodily and mental health.

Professor Dols rightly emphasizes the extraordinary interest of this treatise: on the one hand, it shows in marvellous detail the sway of the Hippocratic/Galenic concepts of climate, temperament, and materia medica over medieval Islamic medicine. On the other hand, ʿAbR has a keen eye and a sharp pen, more so than most of his colleagues, for the geographical, social and professional details of his own time. Dols accordingly devotes the two longest sections of his introductory essay, which justifies the bold title of his book to some extent, to "Galenism," the theoretical framework of most of Islamic medicine, and to "The medical profession." To be sure, much of the material collected here—particularly concerning the Greek tradition—is secondhand; and, reviewing the troops of assiduous, sometimes indiscriminate, references, one wonders if the aims to address both the general public and the specialists will not interfere with each other. On the whole, however, the introduction, which goes on to give a historical sketch of Fatimid Egypt, portraits of ʿAbR and Ibn al-Jazzār and a summary of ʿAbR's treatise, is very valuable. (For an earlier birthdate of ʿAbR—377/988—than the one commonly alleged, which makes better sense, see the *Journal of Near Eastern Studies,* 1977, *36:* 139f., and *Die Welt des Orients,* 1983, *14:* 281.)

The edition of the Arabic text is a bit of a mess. While the seven manuscripts (for an eighth—Cairo, Dār al-kutub, ṭibb 355—cf. *al-Mawrid* IX 3, 1400/1980, 296) that are known to contain the treatise are duly listed and described, no attempt has been made to delineate their mutual relations. Instead, one complete manuscript serves as a kind of original copy, with variant readings used where plausible. The apparatus criticus, a heap of notes, follows the text instead of accompanying it, the sigla of the Cairene mss. (Arabic p. 37) are not clear to me. The typed text is tiny, clumsy and not free from orthographical blunders; the folio figures which should refer the reader to the translation are lost in the thicket of the text.

Cooperation between editor and translator does not seem to have been consistent. Thus, the paragraphs of the two parts do not always tally; and sometimes the text translated is not that edited but that of the apparatus criticus: cf. note 9 on Arabic p. 38 and the *talajjaja* (?, Arabic p. 20, line 4) versus *talḥaju* (p. 116, note 4).

The wealth of material, primary and secondary, of this book is made accessible by a glossary to the translation and indexes to the introduction, the text and to the translation.

Reviewed by H. H. BIESTERFELDT, Seminar für Orientalistik und Indologie, Ruhr-Universität Bochum, Federal Republic of Germany.

TIZIANA PESENTI *Professori e promotori di medicina nello Studio di Padova dal 1405 al 1509: Repertorio bio-bibliografico.* Trieste, Italy: Edizioni Lint, 1984 (Contributi alla storia dell'Università di Padova, no. 16). 279 pp L30,000 (paperbound)

This volume is at once a useful addition to the history of the University of Padua and a valuable collective portrait of a major fifteenth-century scientific and intellectual community Tiziana Pesenti's bio-bibliography is based both on a thorough survey of the existing scattered monographic literature regarding members of the medical faculty at Padua and on extensive archival and manuscript research at Padua and elsewhere. The author took as her point of departure the list of fifteenth-century medical professors established by Facciolati, an eighteenth-century historian of the university Subsequent investigations, by Pesenti and others, have produced a few emendations to Facciolati's list. More importantly, the present volume amasses a rich and often thought-provoking body of information about a large proportion of those who are known to have taught medicine or presented candidates for medical degrees For each of these individuals, the author supplies a detailed resumé of what is known of his career and a bibliography of secondary literature, together with a list of manuscripts and editions of his written works (and notices of testimonies regarding works that have not survived)

Pesenti's work may be set alongside the various other regional bio-bibliographical surveys that have in recent years greatly enlarged our knowledge of the entire range of medieval and Renaissance medical activity and practitioners However, Pesenti's focus upon a university community that was in the fifteenth century already one of the main centers of medical education in Europe makes the present volume of special interest from the standpoint of the history of the development of medical learning in the context of Renaissance intellectual and scientific life The bio-bibliographies assembled reveal a flourishing medical community with a rich literary output. In addition to producing numerous works on medical *practica,* members of the medical faculty at Padua shared broad philosophical and, in several cases, humanistic interests. The value of the *repertorium* is much more than merely local, as many of the most famous figures in fifteenth-century northern Italian medicine taught both at Padua and elsewhere. Access to the information contained in the work is facilitated by the presence of a comprehensive series of indices.

As a reference work, Pesenti's *repertorium* will be useful to anyone concerned with late medieval and Renaissance medicine and the emergence of Padua as a major center of medical teaching, investigation, and innovation The work also serves as a companion volume to the collection of essays on fifteenth-century Paduan philosophical and scientific culture edited by A. Poppi under the title *Scienza e filosofia all'Università di Padova nel Quattrocento,* and throws much additional light on the themes of some of the studies therein The appearance of these two volumes significantly advances our knowledge of the interaction of medical, philosophical, and humanistic cultures in the fifteenth- and early sixteenth-century Italian academic milieu

Reviewed by NANCY G. SIRAISI, Department of History, Hunter College and the Graduate School, City University of New York, New York.

MICHELE SAVONAROLA. *Libreto de Tute le Cosse che se Manzano: Un libro di dietetica di Michele Savonarola, medico padovano del secelo XV,* vol. 1. Edited by JANE NYSTEDT. Stockholm: Romanska Institutionen, Stockholm Universiteit, 1982. 227 pp.

Michele Savonarola's little treatise on the things one eats was very popular during the late fifteenth and sixteenth centuries. This is not surprising because his discussion of foods is arranged in ways a non-physician would find appealing, grouping together, for example, the grains, the vegetables, the spices, and the "two-footed animals," each in a section with a general preface. Savonarola fully investigated his topic in the standard Latin and Arabic authorities, but goes beyond this academic discussion to reveal the opinions of Ferrarese matrons (on the preparation of grains and vegetables) and methods of cooking (especially in preparing meats) Throughout he makes frequent recommendations to the Duke of Ferrara, Borso d'Este, for whom the work was composed

Nystedt provides a critical edition of the six early manuscripts and one printed edition of this work, together with an introduction, notes, glossary, and variant readings—the full scholarly apparatus. None of Savonarola's other vernacular treatises have received such painstaking attention. However, she selected the treatise to represent early fifteenth-century Venetian dialect as well as to provide an example of the vernacular work of physician-humanists She promises a second, analytical volume which will treat these linguistic aspects of the text. This work, then, is not offered for general medical historians, even though an English summary of the introduction is provided, and most will find the edition very difficult to read even with the aid of the glossary of regional, dialectical, and antiquated words in the text. The index of "ingredients" mentioned may conceivably be useful to some, but it would have been better to have references to the various illnesses created or cured by foods.

In her introduction Nystedt mentions a few of the interesting details Savonarola's entries provide about food habits and medical dietetics. For the most part she acquaints the reader with humoral theory and the six non-naturals There is no analysis other than textual analysis here, so the modern language introduction will not help the average reader find out details about foods for the rich and foods for the poor; recommended cooking procedures for meats and vegetables; the extent to which Savonarola is willing to challenge ancient authorities, or Savonarola's perception of cultural differences as an explanation of food choices. For the history of foods and nutrition, for studies of ordinary illnesses and their treatment in the fifteenth century, for medical attitudes to the treatment of rich and poor, and for the challenge of received tradition, a less obscure version of this treatise, or a more extensive introduction, would be a valuable addition to medical history. Nevertheless, careful, scholarly editions such as this one are never unwelcome

Reviewed by ANN G. CARMICHAEL, Department of History and Philosophy of Science, Indiana University, Bloomington.

Fracastoro's Syphilis. Edited and translated by GEOFFREY EATOUGH. Liverpool. Francis Cairns, 1984 vii + 295 pp £17 50, $30.50

Fracastoro's poem *Syphilis,* first published in 1530, is known to most historians of medicine as very little more than the eponym of the disease—an idyll which somehow commemorates the onset of a loathsome epidemic It is difficult to read, especially in the numerous translations, and confusing to the medical or historical specialist looking for plain meaning. Furthermore Fracastoro's ideas about the disease and its etiology may be gathered more easily from his masterpiece, *De contagionibus et contagiosis morbis* (1546), which has no such complexities or difficulties of comprehension in either Latin or English. Even in its best modern edition and translation (that of Wynne-Finch in 1935), the poem remains for the medical historian little more than a footnote to the history of disease etiology For the classicist, on the other hand, it is, as Geoffrey Eatough states in this significant new edition, perhaps the most famous Renaissance Latin poem. In his impressive *Introduction* and *Notes* he is obviously endeavoring to reconcile these two worlds and explain the significance of the poem to the modern world.

In this he succeeds admirably. His *Introduction* deals with the general historical and literary significance of the poem, Fracastoro's life, intellectual circle, and literary biography; the historical origins of syphilis; Fracastoro's view of it, and the poetics, significance and meaning of the poem itself.

This is certainly the most capable modern explication of the complexities of *Syphilis* part epic, part idyll, from time to time epyllion, and throughout an exercise in explaining and reconciling to Fracastoro's contemporaries, the apocalyptic world of the early sixteenth century through the vehicle of classical mythology. Faced with the aesthetic problem of dignifying syphilis as the subject of a poem, Fracastoro devoted Book I to an epic picture of the disease in all the horror of its early epidemic manifestation, tracing its etiology to the disruption of the cosmos as a result of the anger of the gods, and its transmission to man by the Lucretian *semina* through the air Fracastoro did not support the idea of the American origin of the disease, then becoming fashionable, because he believed that its cosmic origin ensured its transmission throughout the world. These ideas are more fully developed in *De contagione*. In Book II he develops the theme of the apocalyptic nature of his age, generates a whole pharmacopeia of prophylactics and therapies, and concludes—as a vehicle for discussing the mercury treatment of the disease, with the legend of Ilceus This takes the familiar classical form in which the simple gardener of the gods kills the stag of Diana, is afflicted by a dreadful leprosy-like pestilence as a punishment, to be redeemed and treated by the agency of Venus and Callirrhoë (the sacred fountain), who enable him to bathe in the miraculous therapeutic river of mercury in the underworld. In Book III Fracastoro begins with an epic on the voyages of discovery, but soon focuses on the Holy Tree, guaiacum (*lignum vitae*) and the Eden-like nature of the New World, complete with the serpent-like presence of the disease To embellish this picture, he anticipates Heyerdahl in characterizing the natives of this new paradise as survivors of Atlantis, and concludes with the parallel legend of Syphilis This again takes the familiar form. of a shepherd who blasphemes Apollo, is afflicted with the disease, and is eventually provided with the healing tree Eatough is a comprehensible and generally sensible guide through these complexities, linking the various levels of significance and understanding with apparent easy mastery The *Notes* are an education in themselves, ranging over the realms of classical scholarship, poetics and philosophy with a sure touch

The editor is not so certain in his handling of the historical material Historians will not appreciate his tendency to make causal connections between "influences" on the basis of the loosest associations or suppositions in tracing Fracastoro's intellectual pedigree. More specifically, some of his historical statements are highly questionable. concerning Leo X's politics, Venice's position in the religious struggles of the sixteenth century, and the degree of restriction of expression experienced by Fracastoro in mid-sixteenth-century Venice His description of Diaz d'Isla's work on the origins of syphilis in Europe (1539) as "the biggest stumbling block to the anti-American [*sic*] theory" of the origins of syphilis is much too strong Diaz's account, obviously the work of his senescence, is highly unreliable on many counts, and much less authoritative than that of Oviedo. Nor is Eatough correct in suggesting that the initial ferocity of the disease disguised its sexual origin from early sixteenth-century observers. They were very early aware of the sexual nature of its transmission, and Eatough is nearer the mark when he suggests that there was a reluctance for social reasons to recognize it.

The translation, alas, suffers from adherence to the contemporary convention that translators of Renaissance literature are not considered appropriately employed unless engaged in producing fake antiques—literal reproductions in English words of sixteenth-century Latin style Of course the Renaissance itself was something of a golden age of fake antiques, but surely this does not justify such barbarisms as the following (I, 68–73).

> What is more, they say that the nations outside Italy caught it [syphilis] for the first time simultaneously and the Spanish race which dared to cut through unknown seas with their prows did not know it earlier than those peoples whose bounds are set by the lofty Pyrenees and the main, who are girt by the Alps and the twin-horned Rhine, or indeed before the rest who are contained in the wide realms beneath the cold North Star.

Anyone who has suffered through his own construing of the *Aeneid* or the *Georgics* will recognize what Eatough is doing, and regret it The old-fashioned translators of the nineteenth and early twentieth centuries may not have had the modern passion for "accuracy," but they did understand that comprehensible translation meant genuine English prose or poetry

Reviewed by JOHN NORRIS, Division of the History of Medicine, University of British Columbia, Vancouver, B.C., Canada.

PETER MORYS. ***Medizin und Pharmazie in der Kosmologie Leonhard Thurneissers zum Thurn (1531–1596).*** Husum, West Germany. Matthiesen Verlag, 1982 (Abhandlungen zur Geschichte der Medizin und der Naturwissenschaften, no. 43). 179 pp. DM46,00 (paperbound)

Leonhard Thurneisser was one of those figures whom Renaissance academics loved to hate and who now set a variety of enticing puzzles to their modern-day counterparts. Thurneisser's life has that vividness which we expect of the Renaissance maverick. He was successively, and sometimes simultaneously, a goldsmith, botanist, prodigious traveller, mine owner, inventive smelter, and successful entrepreneur, especially in Berlin where he received the patronage of the ruler of Brandenburg, sold horoscopes, cosmetics, and medicines to the courts of Europe and acted as a mining consultant, banker, printer and mineral-water analyst.

Peter Morys's dissertation, which is now published, takes a history of ideas approach to Thurneisser's cosmology, chemistry, and medical ideas and practices. Thurneisser's life forms the opening of the book but little attempt is made to integrate Thurneisser's career and social situation with his brand of Paracelsianism. More of this in a moment.

Morys's account is a brief and well documented description of Thurneisser's writings which will be useful to historians of medicine and of Paracelsianism who may want a paraphrase of Thurneisser's ideas Thurneisser's debt to Paracelsus was great. The Tria Prima (Salt, Sulphur and Mercury), the language of spirits, bodies, and virtues predominated in his writings as did the Paracelsian emphasis on minerals, chemical analysis, and digestive processes Thurneisser gave some unity to his explanations by dividing them into threes (three spirits, etc.), this stemmed from his belief in the primacy of God the Trinity. There were one or two differences Thurneisser, no doubt because he was a printer, expressed a greater confidence in books than had Paracelsus, who preferred the book of nature, he was also more favorable to the study of anatomy. However, there is little in Morys's book which would make one disagree with Walter Pagel's verdict that Thurneisser is a more flowery version of Paracelsus.

As history of ideas, the book has weaknesses Its focus is narrow, not enough is said of Thurneisser's influence and the wider intellectual context of his work. Another problem is that when Morys comes to a difficult term, instead of explaining it, he merely repeats it verbatim and leaves it as its own explanation (e.g., the "Subtilitet" of plants, p. 82). Overall, however, Morys has produced a reasonable account and his description of Thurneisser's therapeutics, where he shows us how theory could justify practice, is a valuable addition to the literature

Nevertheless, books such as Morys's are beginning to have an old-fashioned look to them. Mere elucidation of texts and tracing of the ancestry of ideas is not enough Ideas can be integrated with the society they came from. Here is one example. Morys writes that Thurneisser believed that illness was God's punishment and as a historian of ideas he dutifully records that this was a classical concept. But he does not note a more significant point: Thurneisser was a Protestant, he shared in the providential view of life which was held much more firmly by Protestants than by Catholics. Illness was God's punishment, certainly, but it was also an indication of God's assessment of one's recent actions The idea had a contemporary vibrancy which is lost by the allusion to classical antiquity Or again, although the violent condemnation of Thurneisser by Galenic physicians is noted, much more could have been made of the fact that there were large sections of society that made use of Thurneisser and accepted him This was not an isolated instance, a little later, the French and English kings accepted iatrochemistry. Discussion of why Thurneisser found a niche in society would also tell us much about his ideas The need and belief of society in systems of magic, alchemy, and astrology ran deeply, as the success of Thurneisser's career itself testifies

Reviewed by **ANDREW WEAR**, Department of History and Philosophy of Science, King's College, University of Aberdeen, Scotland.

JUANITA G. L BURNBY *A Study of the English Apothecary from 1660 to 1760.* London Wellcome Institute for the History of Medicine, 1983 (Supplement to *Medical History,* no. 3). 128 pp £9.00; $18 00 (Order from Science History Publications, Bucks, England).

Dr. Burnby has produced a small book that seeks to study the English apothecary—not only the London apothecary and the Worshipful Society of Apothecaries of London—in detail for the first time. On the basis of a meticulous search of a variety of public records including church records, professional society records, guild records, genealogical records, and more, as well as secondary works, she has produced a very highly detailed account. So detailed, in fact, that often the forest cannot be seen for the trees. Especially, if a metaphor may be mixed, when the trees are family trees, for the author has relied on genealogy a great deal

Burnby has sought, with some success, to counteract the denigration to which the apothecary has been subjected, both professionally and socially, in the literature In the first place, the seventeenth- to eighteenth-century apothecary was already more than a dispenser of drugs. by 1700 he was a physician, surgeon and pharmacist, and sometimes a grocer as well Burnby, in tracing the place of the apothecary in the evolution of the medical profession, emphasizes this multiplicity of function, especially in the provinces where the practitioner was not just an apothecary but usually a "surgeon-apothecary." Indeed the surgeon-apothecary was already a general practitioner by the early eighteenth century Given the parlous state of medical education and licensure, it is not difficult to understand why professional titles, given to and used by the practitioner, were often misleading, often changed from one to another at will, and often used interchangeably.

In addition to this role as "an essential factor in the genesis of the general practitioner," the apothecary is characterized as the progenitor of experimental and manufacturing chemistry, of the pharmaceutical wholesaler and manufacturer, and of the dispensing chemist and pharmacist. For the manufacturing chemist, Burnby can fall back on one or two English apothecaries; for pharmaceutical manufacturing she has a more substantial base. With regard to the dispensing chemists, the author points out that the contention that they came from nowhere in the last two decades of the eighteenth century—usually, she might have added, to fill the void left by the apothecaries as they moved more and more into medicine—begs the question and is untrue She notes that the dispensing chemist was already in existence by mid-century, that he functioned like an apothecary except that he did not make outside visits, and that the origins of many pharmacies were to be found in the apothecary shop.

The chapter on the apothecary as a man of science points up the many contributions of the English apothecary to botany. In chemistry, the English apothecary made no direct contribution, in contrast to the continental apothecary. In medicine, the author has had to strain a bit: her main contributors were physicians—Fothergill, Withering, Jenner—who started their careers as apprentices to apothecaries. Indeed, this points up the distinction that should be made between a contribution from a man who happened to have been trained or practiced as an apothecary and a contribution that derived directly from apothecary practice. While Petiver's interest in botany directly related to his profession, Watson's interest in electricity did not

Burnby found the apothecaries reasonably well-trained and men of broad cultural interests. They were, moreover, especially in the country, often men of good family.

Dr. Burnby has examined the records of the Inland Revenue (c. 1710–14) and found that of 223 apothecary apprentices she could determine the parentage of 177. Of these, ninety-five had a parent in the professions or who was described as a "gentleman."

In an account that is so very replete with details, it is surprising that there have been omissions The dispensary conflict between the physicians and apothecaries of London at the end of the seventeenth century, important for the historical demeaning of the latter that derived from it, is barely mentioned Yet the charges against the apothecaries were certainly worthy of examination and discussion Given even less passing mention is the practice the apothecary maintained by correspondence and the custom of referral and consultation between the apothecary and the physician

Burnby's book, because of the minute detail, is not easily read, but it is replete with information. The status, role and general importance of the apothecary have all been boosted by her study.

Reviewed by DAVID L COWEN, Professor Emeritus of History, Rutgers, The State University of New Jersey, New Brunswick

JOHN D SPILLANE *Medical Travellers: Narratives from the Seventeenth, Eighteenth, and Nineteenth Centuries.* Oxford and New York: Oxford University Press, 1984. xi + 236 pp. Ill $45 00

The author of this book, a physician and traveler himself, apparently enjoys reading travel accounts written by medical professionals in previous centuries. Selecting ten of his favorite narratives, he has distilled them into brief summaries of the originals

All the accounts were written by British surgeons and physicians—including non-practicing professionals such as Tobias Smollett. With the exception of John Bell's two-decade sojourn in Russia (1715–37), the narratives derive from ocean voyages or land travels lasting one to three years. They span from Edward Browne's (son of Sir Thomas Browne) meanderings in 1668–69 between London and Vienna, to Thomas Hodgkins's Marrakesh expedition in 1863–64. While most of the accounts describe regions of Northern Europe or the Mediterranean basin, there are glimpses of colonial North America (Alexander Hamilton, 1744), New South Wales (John White, 1787–88), and China (Clarke Abel, 1816–17)

The author organizes these accounts in chronological order prefacing each with a biographical sketch and a hazy mention of the times—especially the political or military context—in which each journey took place. The best of these brief introductions, in terms of providing historical background, sets up the 1815 trip of Richard Bright east to Vienna where an impressive assemblage of notables was establishing ground rules for peace in post-Napoleonic Europe

This odd volume cannot be characterized as collective biography, history of travel, or medical history. Occasionally interesting medical tidbits do surface, such as Bright's observation that in Budapest, Hungarian was the language of instruction at the school of surgery, while medical students listened to lectures in Latin Even more provocative in medical terms were the travelers' perceptions of health in non-European lands, e.g., Djakarta (Abel), and Constantinople (William Wittman). In fact, Wittman's account of his three years (1799–1802) in the Middle East appears to be a full-fledged medical topography that is said to include appendices on mortality and climate in the region

All of these accounts are treated as straightforward travelogues with the emphasis on paraphrase rather than analysis. Little continuity is established between the narratives, and no effort is made to place them in the ever-evolving course of European medical history. And given that they span the period from Sydenham to Koch, this is a disappointment But neither do we get much of a sense of the travelers themselves because the narratives are so intensely condensed. One is left wanting lengthier quotations, with the author concentrating on editing and annotating rather than paraphrasing.

Reviewed by J D. GOODYEAR, Department of History, The Johns Hopkins University, Baltimore, Maryland.

MARTIN KAUFMAN, STUART GALISHOFF and TODD L SAVITT (eds), ***Dictionary of American Medical Biography.*** With the assistance of Joseph Carvalho 2 vols. Westport, Connecticut. Greenwood Press, 1984. xvi + 1,027 pp. $95.00 (set)

This work is a welcome addition to the standard biographical references on American physicians It has been more than half a century since the last edition of Kelly and Burrage's *American Medical Biography* appeared and a supplement was certainly needed. The present work includes many of the same individuals covered in Kelly and Burrage and I would have preferred that the editors had elected to avoid any overlap. This would have allowed them to include individuals for whom it is relatively difficult to find biographical information A strength of this new dictionary is its inclusion of subjects who were not "regular" physicians The editors have included representatives of the basic medical sciences and "persons outside the mainstream of American medicine—health faddists, patent medicine manufacturers, unorthodox practitioners, and others whose major role was to provide alternatives to traditional medicine . . ." This was a good decision and reflects both the interests of the editors and the growing awareness of the need to consider the contributions to health care made by non-physicians. The editors have also attempted to obtain some geographical balance and to include minority representatives These editorial decisions inevitably led to the inclusion of a number of relatively minor figures and the resultant exclusion of more significant individuals whose only fault was their traditional approach, urban location, race or sex. Nevertheless, the result is an interesting cross-section which reveals the diversity of individuals who participated in health care delivery in America over the past several generations

The entries, each about 300 words long, are concise and generally well written. They are fairly uniform when one considers that 100 authors contributed to this biographical dictionary. Each entry includes information on the subject's parents, education, marriage and children, career, and a brief, and necessarily subjective, assessment of his or her contributions. The brevity of the individual sketches is excused by the consistent inclusion of references to other published biographical information In addition, up to five of the subject's own publications are listed. One of the editors, Stuart Galishoff, wrote about one-quarter of the entries These are of consistently high quality. Useful appendices include listings of subjects by date of birth, place of birth, state where prominent, specialty or occupation, and medical school or college attended A separate list of women subjects is included, as is a comprehensive name-subject index

The dictionary was published in two small octavo volumes which are handsomely and sturdily bound. Some will undoubtedly find the type selected for the references, appendices and index too small, but the work is well printed and the text very clear. This is a convenient source for basic details on the careers of hundreds of American physicians and health care personalities. It will join the earlier biographical works of Thacher, Williams, Atkinson, Watson, and Kelly and Burrage as an indispensable reference for anyone interested in the history of medicine and health care delivery in the United States It is reasonably priced and should be available in all libraries with collections in the health sciences The editors request suggestions for future editions—I only hope they publish supplements rather than republishing the present biographies with a few additional subjects There are thousands of "lesser" figures who are not included but whose contributions to medical science, education and practice were of importance in the development of the present state of medical care in this country It is pleasing to have a major new biographical source for American medicine

Reviewed by W. BRUCE FYE, Department of Cardiology, Marshfield Clinic, Marshfield, Wisconsin.

JON FRANKLIN and JOHN SUTHERLAND ***Guinea Pig Doctors: The Drama of Medical Research through Self-Experimentation.*** New York: William Morrow, 1984. 317 pp. Ill. $17.95.

The history of auto-experimentation by physicians has received little attention. Franklin and Sutherland's attempt "to trace a golden thread through the fabric of science" does not enhance our understanding of this dimension of medical research Although they allude in introductory pages to the ethical, legal, and scientific aspects of self-experimentation, they devote the bulk of the book to dramatic reconstructions of the auto-experiments of seven physicians and one dentist. In addition to the well-known experiments of John Hunter, Max von Pettenkofer, and Werner Forssman, they include the more obscure researches of the American dentist Horace Wells and Daniel Carrion in the nineteenth century, and in the twentieth century, those of William Harrington and John Paul Stapp. Perhaps most questionable is their reconstruction of the experiments of Jesse Lazear, a member of the Yellow Fever Commission Lazear died in 1900 from yellow fever, although the circumstances of his infection are ambiguous The authors ignore Lazear's own conflicting account, insisting that Lazear died as a result of an experimentally-induced case of yellow fever Since they bring no evidence to support either this assertion or the claim that Lazear, and not Walter Reed, deserves the credit for the realization that the *Aedes aegypti* mosquito transmits yellow fever, it is difficult to entertain such theories In fact, the entire book suffers from the absence of references and the lack of a bibliography *Guinea Pig Doctors* remains in essence a storybook of eight men who viewed their bodies "as a court of last resort"

Reviewed by SUSAN EYRICH LEDERER, Department of the History of Science, University of Wisconsin, Madison

ANDREAS KORTGEN. ***Die Gesundheit des Fürsten.*** Frankfurt am Main-Bern: Verlag Peter Lang, 1982 (Marburger Schriften zur Medizingeschichte, no. 3) 231 pp Sw. Fr. 53,00.

If medicine is to be regarded as part of a civilizing process emanating from royal courts and aristocratic houses, then the health of rulers requires the attention of medical historians. Studies like Norbert Elias's *The Civilising Process* have argued that courtly-aristocratic models and values became the norms throughout modern nation-states Körtgen's study side-steps the sociological heights of Elias and of other social theorists of elite culture, and takes a rather pedestrian empirical approach to a selection of primary sources, most of which are advice books. The chosen time span is ambitiously large—from antiquity to the twentieth century. The study is really about the persistence of classical traditions of dietetics, and of the non-natural Hippocratic traditions of the need for a healthy environment and a healthy lifestyle Chapters deal with such themes as climate, air, occupation and stress, nutrition and clothing. The author argues that within ancient writings on such themes, there can be found modern principles relevant to today's search for a reformed and more humane medicine, which should rely more on prevention and the promotion of a positively healthy lifestyle, and which should place less reliance on therapy.

Like many German medical and (as in this case) dental dissertations, the work is a rather scrappy scissors-and-paste compilation of quotations from primary sources. Yet the author is to be commended for including an ambitious range of literature, including Latin, French and English sources The omission of secondary literature means that valuable comparisons to the earlier work of Alfons Fischer on *Kulturhygiene* or to Paul Slack's recent study of Tudor advice books are missing The author's concerns are primarily with the ancients rather than with any modern commentators The neglect of modern secondary literature has meant that there is the occasional inaccuracy like the attribution of *Macaria* to Hartlib rather than to Gabriel Plattes The author's conclusion is that the lesson which one can learn from the ancients is "moderation in all things." Perhaps a further lesson is that every citizen deserves the same favorable diet, housing and environmental conditions as those enjoyed by privileged social elites.

Reviewed by PAUL WEINDLING, Wellcome Unit for the History of Medicine, University of Oxford, England.

PAMELA BRIGHT. ***Dr. Richard Bright (1789–1858).*** London: The Bodley Head, 1983 313 pp. Ill $22.95 (Distributed in the U.S by Merrimack Publishers' Circle, 47 Pelham Road, Salem, New Hampshire 03079).

Richard Bright's great-great niece, Pamela Bright, has explored the Bright collection of documents and letters, and the family letters and papers of the Houses of Anthony Gibbs and Sons, and has given us a detailed description of the personal life of the great English physician, Richard Bright. The result is a history of the individual and not an exploration of the development of the science of clinical observation to which Bright made such a pivotal contribution. It is clear that Bright came to occupy a position of reverence in his day which, in many ways, was similar to that later attained by William Osler Despite the extremely important contribution which his accurate clinical observation and clinico-pathological correlation made to the advance of medicine during the latter half of the nineteenth century, Bright cannot be considered to have been a rigorous scientist in the strict sense. He did not set out to prove specific hypotheses nor did he design or perform experiments. He was primarily an observer and a documenter with a talent for noticing detail and an even greater ability to avoid injecting bias into his observations. When sufficient data were collected, he allowed the facts to speak for themselves

Pamela Bright's biography gives us some insight into the mind of the man and his social and educational opportunities. His father, a businessman, had a fascination for science and rubbed shoulders with the likes of Joseph Priestley, George Watts, Joseph Banks and Erasmus Darwin. It was with a background such as this that Bright sallied forth into the private school system available to those of means After studying for his medical degree at Edinburgh University, Bright spent four months on an expedition to Iceland under the leadership of Sir George Mackenzie, a voyage which earned him a respectable reputation as a geologist. To continue his studies he then sought an institution in which clinical teaching was of the finest caliber It was to Guy's Hospital in London that he moved in 1810. Under the influence of William Babington and Astley Cooper, he developed his interest in pathology We are told that he drew his first picture of a granular kidney in 1811. After two years at Guy's, Bright returned to Edinburgh and completed his doctoral thesis, in which he showed that erysipelas was a contagious disease.

It is remarkable that Bright's fame was first achieved, not through medicine, but through the publication of his book, *Travels from Vienna through Lower Hungary* He travelled to Leyden, Frankfurt, Leipzig, Berlin and Vienna, through the villages of Hungary, and on to Budapest, observing the local medical practices as well as the behavior of the nobility. Nowhere is Bright's talent as an observer more clearly apparent than in the beautiful sketches which he prepared and which were faithfully engraved for his book. In 1820 Bright returned to Guy's Hospital to embark upon a career which has been heralded as a high point in the history of medicine and pathology. Pamela Bright conveys the excitement at the bedside and in the autopsy room when Bright, Addison and Hodgkin debated over difficult cases before eager and admiring assistants and students

Bright is best known for his description of the renal diseases. What was it that he actually described? It is here that the biography falls short, for this is certainly the critical issue in evaluating his lifework. Bright's contribution, in essence, was to point out the strong association of dropsy (generalized edema), albumin in the urine, and disease of the kidneys He was not the first to notice that patients with dropsy have diseased kidneys nor was he the first to point out that coagulable urine was associated with dropsy. What Bright did was to accumulate evidence that was so overwhelming that the ever skeptical medical community was convinced of the need to reformulate its approach to the patient with dropsy. It became obligatory to examine the urine for the presence of albumin and, if it was detected, then it indicated that the seat of the disease was in the kidneys. It is the evolution of Bright's thinking on this topic about which Pamela Bright fails to enlighten us.

Pamela Bright has given us a complete portrayal of Bright's personal life. However, there is still a need for a detailed description of the discovery of "Bright's Disease" which deals with Bright's intellectual contribution to the field. Did he simply collect enough material to confirm previously described phenomena? How did Bright's descriptive approach to science compare with that of the more quantitative biologists and clinicians of the time? Was an attempt made by Bright and his colleagues to search for a common pathophysiology in cases of dropsy secondary to a variety of causes? Questions such as these are unanswered in Bright's writings and it will require a serious investigation of his professional correspondence and the writings of his colleagues and associates to find the answers.

Reviewed by LEON G. FINE, Department of Medicine, University of California, Los Angeles.

JOHN E. LESCH *Science and Medicine in France: The Emergence of Experimental Physiology, 1790–1855.* Cambridge, Mass. and London· Harvard University Press, 1984. 276 pp. $25.00.

John Lesch has resolved a longstanding paradox in existing accounts of the rise of experimental physiology in France. On the one hand, Owsei Temkin asserted that by receiving training in surgery, physicians seeking to establish the discipline of experimental physiology acquired the foundation of operative skill and technique essential to realizing their goal of introducing experimental control over vital phenomena Yet, in seeming contradiction to this, Ackerknecht demonstrated that therapeutical nihilism, which was the hallmark of the Parisian clinical tradition within which the founders of experimental physiology were trained, fostered attitudes contrary to direct intervention and control. How did experimental physiology emerge in this environment? The traditional answer has been that physicians who sought to place physiology on an experimental scientific basis did so by breaking with clinical and hospital medicine to gain independent institutional status for their discipline Lesch adds substance to Temkin's claims by demonstrating through examination of numerous concrete examples the role of surgery in shaping both skills and attitudes of the experimental physiologists. But his major contribution is in revising the traditional account by demonstrating that interaction with the Paris clinical tradition supplied important direction to experimental physiology, in particular by furnishing a constant source of clinical problems, pathological material, and—equally important—by infusing attitudes supportive of positivistic approaches and the discouragement of programmatic attempts to construct all-embracing theories of life.

Essential to Lesch's resolution of this paradox is the careful manner in which he places the developing threads of experimental physiology within the institutional context of the Revolution and First Empire. Three aspects of the Parisian institutional environment constantly interact in the biographies of the principal figures in Lesch's study: the effects of the utilitarian oriented reforms of 1794 which united surgical and medical instruction; the emphasis on experiment, comparative anatomy, and physical and chemical approaches fostered by the scientific elite of the First Class of the Institute; and the concerns of pharmacists to rationalize the preparation of drugs in order to win and consolidate their status as professionals. Skillfully interweaving these threads, Lesch's approach is that of the radical contextualist or ecologist of knowledge: he examines the role of the immediate environment in shaping the aspirations and careers of the principal actors; the role of values and culture in shaping their attitudes toward physiology and even their choice of methods; the role of institutions in structuring the conceptual tools and technical competencies in terms of which careers are shaped. As individuals work within and move between these contexts, successive layers of technique and conceptual orientation come to be superimposed, leading to the formation of the discipline of experimental physiology and its institutional organization.

The career of Magendie, the central figure in Lesch's drama, illustrates the role of these different contexts in shaping the evolving discipline of experimental physiology in the early nineteenth century. Among the first generation of physicians to be trained under the new system emphasizing the union of surgery and clinical experience, Magendie found his aspirations of attaining an academic appointment in the faculty of medicine in Paris blocked. Magendie, and others of his generation similarly situated, entered into private practice and turned the focus of his well-developed social ambitions on the First Class of the Institute. Directing his studies toward the Institute rather than the Paris medical community, Magendie began to introduce the rigorous method of the physical sciences into his work. But if Magendie's orientation toward the Institute directed his physiology away from the medical community, another context exerted a force equally powerful in directions which would ultimately lead to the establishment of science-based medicine. Magendie's private medical practice and his later appointment by the central board of the Paris hospitals drew his attention to the problem of placing drug therapy on a sound scientific basis. This practical concern together with his scientific interest in developing precise methods of operative control for the purposes of his physiological localization studies led Magendie to pathbreaking cooperative work in pharmacology with Pelletier and Caventou. Through his drug action studies, a new chemical layer was superimposed on the older operative and anatomical stratum of Magendie's physiology

Lesch devotes the same attention to demonstrating the role of the Paris medical milieu in shaping Claude Bernard's conception of a general science of life. The experimentalism, use of clinical and pathological material, and emphasis on operative control and localism in Bernard's investigations on the nervous system between 1843–53 beautifully illustrates Lesch's claim that Bernard's professional training, his apprenticeship with Magendie, and his active life in the medical community left their imprint on the mature formulation of his science and its philosophical underpinnings

Many historians of science and medicine will find the historiographical perspective of this book stimulating. In contrast to intellectual histories which stress the role of philosophical orientations and programmatics as the leading edge in the growth of knowledge, this book is one among a growing number of studies emphasizing the interaction of environment, training and the technical culture of science—what Thomas Hughes, one of the leading practitioners of this new historiographical orientation, calls "messy vitality"—in shaping the intellectual content of science and its institutional organization. *Science and Medicine in France* is an illustration of this new approach at its best.

Reviewed by TIMOTHY LENOIR, Department of History, University of Arizona, Tucson.

F W J McCOSH ***Boussingault: Chemist and Agriculturist.*** Dordrecht-Boston-Lancaster: D. Reidel, 1984. xv + 280 pp Ill Dfl. 140,00; $53.50 (Distributed in the U.S by Kluwer Academic, Hingham, Mass)

Jean Baptiste Boussingault (1802–87) was so esteemed by his fellow chemists that he was elected chairman for one day of the Karlsruhe conference in 1860, but he is given only a paragraph in J R. Partington's *History of Chemistry* and a short entry in the *D.S.B.* His reputation is now firmly established in this very thorough and readable biography based on Dr. McCosh's close study of public and family archives as well as printed works by Boussingault and his contemporaries.

Born into a petit bourgeois family in Paris, and a drop-out from the lycée, Boussingault nevertheless acquired a taste for studying, became interested in science and attended public lectures He entered the mining school at St Etienne and after graduation took up a post at a lignite and petroleum mine in Alsace, where he met the LeBel family who owned a farm and another property with a mining concession. This friendship was to affect his life and career, though he did not know it when he departed for Colombia in 1822. McCosh gives a good account of his ten years in South America, where he was a professor, mining engineer, vulcanologist and explorer On returning to France he became dean of the Science Faculty at Lyon, but left after a year in circumstances that are obscure, though it seems that his conduct was less than impeccable. One of McCosh's merits as a biographer is that he is no hero-worshipper and does not hesitate to draw attention to flaws in Boussingault's behavior or scientific work.

After Boussingault's marriage in 1835 to Adèle LeBel he concentrated on agricultural chemistry, and from 1836 to 1848 he conducted research at the LeBel farm on crop rotation, analyzing all the fertilizers applied to a field and the resulting crop, and proving that a leguminous plant increased the soil nitrogen. His experiments on animal nutrition were also important, though he was less successful than Liebig in establishing the relation between carbohydrate intake and fat formation.

From 1846 onwards, Boussingault occupied a chair in Paris at the Conservatoire des Arts et Métiers, and, apart from a short and unsatisfactory excursion into politics, he divided his time between the Conservatoire and the experimental farm in Alsace. His main interest was now the role of nitrogen in plant nutrition He disproved Georges Ville's theory that atmospheric ammonia provided all the nitrogen required in the absence of fertilizers but, though he demonstrated that no plant could absorb atmospheric nitrogen if grown in sterilized soil, he failed to detect the need for micro-organisms in nitrogen fixation. McCosh suggests that an aging mind could not formulate a completely new explanation, but, as he points out, Boussingault was still able to do good quantitative work on photosynthesis.

McCosh assesses Boussingault as an important chemist but not a great one. Perhaps he is right, but how many chemists are really great? Whatever his status, Boussingault has been well served by his biographer.

Reviewed by WILLIAM A. SMEATON, Department of History and Philosophy of Science, University College, London.

GESA WUNDERLICH ***Krankheits- und Therapiekonzepte am Anfang der deutschen Psychiatrie: Haindorf, Heinroth, Ideler.*** Husum, West Germany: Matthiesen Verlag, 1981. 132 pp DM32,00 (paperbound).

There are at least two reasons why historians should welcome this new addition to the literature. First, previous studies (by Hirschfeld, Mora, Leibbrand, de Boor, Neuburger, and Wissfeld, for example), have pointed to the influence of post-Kantian Romanticism on early nineteenth-century psychiatry. Wunderlich, however, suggests that the first German psychiatrists were influenced to a greater degree by other lines of thought· the vitalistic doctrines of Stahl, and Kant's "Anthropologie," a work on practical psychology which contains his views on insanity.

Second, in other writings (by Ackerknecht, Alexander and Selesnick, Otto Marx, and Zilboorg), the renowned J. C. A. Heinroth (1773–1842), who in 1819 secured the first chair in psychotherapy (psychische Heilkunde) at the University of Leipzig, is typically singled out as the leading exponent of early nineteenth-century German psychiatry. Wunderlich, though, gives as much space to two other important figures of the period. A. Haindorf (1782–1862) and C. W. Ideler (1795–1860).

In elucidating the principal ideas of these psychiatrists, Wunderlich carefully dissects their major textbooks on the pathology and treatment of mental disorders (Haindorf, 1811, Heinroth, 1818; and Ideler, 1835–38). In each case, Wunderlich employs the same discursive pattern He begins with a short biographical sketch, which is followed by sections on methodology, the structure of the mind, the mind/body relationship, the disturbed mind, therapy, and a critical discussion of each psychiatrist. He concludes the entire volume with a comparative discussion of their respective psychiatric systems. The effect of this strategy, coupled with a simple, straightforward style of German writing, makes for an easily accessible volume

The view that mental sickness is a disturbance of the equilibrium between man and his environment was, in a sense, shared by Haindorf, Heinroth, and Ideler. But they differed on specifics: Haindorf's emphasis was on pathological anatomy, Heinroth's on personal guilt, especially sin, and Ideler's on uncontrolled passions. Whereas Heinroth accepted the identity of mind and body; Haindorf and Ideler separated the two.

In therapy Heinroth stressed the self-curative powers of the mind. Faith was of ultimate importance. Religion alone, thought Heinroth, could effectively ward off every possible type of mental illness. The doctor, appropriately, could act as helper, savior, father, benefactor, friend, or the visible image of God On the other hand, Haindorf's treatment was rooted in organic/pharmacological methods; whereas Ideler put psychical therapy into the foreground They all, however, shared a sympathy for the use of commonplace healing methods—bloodletting, cold showers, electricity, even animal magnetism in some instances, as well as restraining chairs, revolving machines, and other forms of punishment.

This study, then, is different from previous attempts to deal with early nineteenth-century German psychiatry Wunderlich has re-oriented our thinking. Not only Heinroth's psychiatry, but Haindorf's and Ideler's too, contain much that is historically important. Moreover, they all were, in the final analysis, scientists; and therefore more concerned with empirically derived explanatory systems, than with philosophical Romanticism, as has been previously thought.

Reviewed by R. A. PASKAUSKAS, Institute for the History and Philosophy of Science and Technology, University of Toronto, Ontario, Canada

DIETER JETTER. ***Wien: Von den Anfängen bis um 1900.*** Wiesbaden, West Germany. Franz Steiner Verlag, 1982 (Geschichte des Hospitals, vol 5). viii + 159 pp. DM64,00 (paperbound)

Hardly any other welfare establishment has been exposed to such a variety of influences over the years as has the hospital. Political and economic considerations have joined the more evident social and medical ones in shaping this institution—

constantly subject to change—and making it an essential component of Western civilization. Moreover, aspects of our social behavior and our humane attitudes are reflected in the architectural and organizational concept of a hospital. Dieter Jetter shows this by giving examples from among Vienna's more important hospitals: "Whoever is able to find his way through the thicket of topography and nomenclature will find he has arrived at a typology of the institution. The singular founding of a hospital can be considered then to be an establishment which could also have come into being in other places One can recognize traits and peculiarities in the uniqueness of a particular founding which could rightfully be anticipated in other places in corresponding hospitals. The rule—one could almost say the law—of the historical process stands out amongst the abundance of coincidence and of the particular" (p. 126).

Jetter's documentation is of great value, for although numerous works about Vienna hospitals have already been written, especially about the General Hospital, until now there has been no all-encompassing portrayal. A question that comes up repeatedly in reading the exemplary studies about the Vienna Medical School is, where did the best doctors in the world at that time actually treat their patients Jetter's book provides the answer. The author abandoned his original intention of gathering and presenting information about all Viennese hospitals. Instead, he decided to limit himself to describing in detail the establishment of ten outstanding hospitals. In a second attempt Jetter selected more than fifty hospitals, arranged them in order according to their dates of foundation, and ultimately described them in such a way that their similarities, rather than their peculiarities, are accentuated. In the process the author has succeeded in giving a complete picture of hospital development through the centuries.

Plans of the sites, a large number of layouts and sketches, engravings and photographs, which to a large extent come from Jetter's own collection, illustrate the text magnificently and show the medical and art historian in him. His conscientiousness and his minute description of the Vienna hospitals are demonstrated in other ways by the extensive and valuable references to the literature. This book, which belongs in every medico-historical library, could serve as a travel-guide to Vienna's hospitals For those who deal daily with this material in Austria, especially in Vienna, it is particularly interesting to see spatial and temporal factors from a neighbor's viewpoint for a change, rather than from that of people living among the facts themselves.

Reviewed by MANFRED SKOPEC, Institute for the History of Medicine, University of Vienna, Vienna, Austria

TREVOR H LEVERE *Poetry Realized in Nature: Samuel Taylor Coleridge and Early Nineteenth-Century Science.* Cambridge and New York. Cambridge University Press, 1981. xiii + 271 pp $39 95.

The epoch of Romantic *Naturforschung* or *Naturphilosophie* is receiving increasing attention after decades of positivistic neglect or refusal to investigate. Contemporary criticism of science and technology, as well as philosophical and sociological historiography of science, finds in that epoch around 1800 elements which throw a new light on the scientific developments of the nineteenth and twentieth centuries, and which still possess a fundamental value for a sensible relationship between man and nature today

In addition to its relationship with philosophy, the science of the Romantic period stood in an immanent and systematically legitimized association with art. This relationship was reciprocal: famous German examples are Goethe, Novalis, Kleist, E T A Hoffmann and C. D. Friedrich Trevor Levere's convincing study of Samuel Taylor Coleridge (1772–1834) calls attention to an important figure in English literature who responded actively—with literary works—and not just passively, against the science and philosophy of his time.

With an extensive knowledge of the scientific and philosophical figures and attitudes of the early 1800s, Levere studies how they are treated and transformed by Coleridge, who viewed himself not as a scientist, but as a poet Some impressive results of the connection and unity of science and art are Coleridge's *Biographia Literaria*, the *Theory of Life*, and his unfinished *Opus Maximum* Levere's analysis of the relationship of Coleridge with the Romantic *Naturforschung* and idealistic *Naturphilosophie* movements is especially detailed. Kant, Schelling, Steffens, Oken, Schubert, Ritter and Eschenmayer are given prominent places Coleridge's lack of interest in Hegel may have numerous causes, but one was his reading of the Hegelian *Logic*, whose arguments obviously did not stimulate Coleridge to study his *Philosophy of Nature*, the second and later part of Hegel's *Encyclopedia* He also maintained a distance from Schelling—and this distance unites Coleridge with the Romantic naturalists The reasons were theological; as a Trinitarian Coleridge observed in Schelling's philosophy of nature the danger of absolutizing nature But his closeness with these philosophers is also manifest. To Coleridge, the formal categories like analogy, metamorphosis, potency and the metaphysical union of nature and spirit were essential He also believed in the possibility of combining science, philosophy and theology His concept of nature develops from cosmology through physics and chemistry to biology and medicine. Life is central, its phenomena and rules limit the reign of mechanism The comprehensive view of the English poet has an aesthetic and religious basis. Also, his plea for the union of reason and emotion was opposed to the ideas of the Enlightenment.

Levere's book scrutinizes Coleridge's relationship with the sciences of his time and therefore offers an important contribution to the history of science of those years. His analysis impresses the reader with its interdisciplinary approach, and its synopsis of science, philosophy, art and theology Levere's knowledge of the primary sources is extensive; the secondary literature is also taken into consideration, with the exception of German research Unfortunately, a bibliography is not given. This excellent book creates a demand for further studies, for example, a comparison of Coleridge's relationship with science and philosophy of nature with that of other poets who had the same interests

Reviewed by DIETRICH VON ENGELHARDT, Institut für Medizin- und Wissenschaftsgeschichte, Medizinische Hochschule, Lübeck, West Germany

RACHEL GINNIS FUCHS ***Abandoned Children: Foundlings and Child Welfare in Nineteenth-Century France.*** Albany: State University of New York Press, 1984 xvii + 357 pp. Ill. $47.50 (cloth); $16.95 (paperbound)

Child abandonment was a major social, economic, and public health problem in nineteenth-century France. The problem was most acute in Paris, where early in the century nearly one-fourth of all newborns and one-half of all illegitimate babies were abandoned every year at the only foundling home which was state-run. Before 1850 between 4,000 and 5,000 babies were abandoned per year. Infant mortality rates of these abandoned children averaged 60 percent, with 20–30 percent of the deaths occurring during the initial three-day stay at the hospice.

As part of the Revolutionary heritage, the French state assumed responsibility for the welfare of its citizens Nineteenth-century French social policy towards abandoned children was based on an 1811 decree, according to which admission to a foundling hospice was free and available to all The decree also provided for the establishment of a foundling hospice in each *arrondissement.* The French cared for abandoned children by a system of foster parentage. Babies were abandoned at the hospice, where they stayed about three days, and were then transported to the countryside to be reared by wet nurses and foster parents.

Fuchs criticizes French social policy towards abandoned children, contending that, until late in the century, economic considerations were more important than the welfare of the children. She suggests that foster parents, the state, and society benefited more from the system than did the children. It is not at all clear, however, that the alternative, institutionalization, was a better solution. When one considers the restrictive admissions policy and regimentation at Thomas Coram's eighteenth-century London Foundling Hospital, French abandoned children were probably better off living with foster parents.

Much of Fuchs's story deals with the transformation of French child welfare policy Other topics include the mothers who abandoned their babies and why, the Parisian foundling hospice, and the national bureaucracy that administered the foundling policy. Fuchs also provides a detailed description of the wet-nursing system and its integral role in the foundling administration. In one extremely interesting chapter she describes the daily life of the rural poor, the socio-economic group from which wet nurses and foster parents came.

This book is highly recommended to anyone with an interest in the interaction of public health and social welfare. It will appeal to historians of the family, social historians, and historians of medicine. The latter group will be interested in child abandonment as a public health problem and the role of physicians in the foundling administration. They may, however, question Fuchs's explanation of the causes of the high mortality of foundlings during their brief stay at the hospice Fuchs stresses inadequate medical knowledge as a prime contributing factor to this mortality However, she does not make clear how medical knowledge was inadequate or how it contributed to infant mortality. Her other explanation of high mortality, which is based on the weak state of infants upon arrival at the hospice and bad feeding practices while there—both due to socio-economic conditions—is far more convincing

Reviewed by ANN F. LA BERGE, Center for the Study of Science in Society, Virginia Polytechnic Institute and State University, Blacksburg, Virginia.

DONALD C GOELLNICHT *The Poet-Physician: Keats and Medical Science.* Pittsburgh University of Pittsburgh Press, 1984. xii + 291 pp $26.95.

Arguing against a critical tradition that has considered John Keats anti-scientific and anti-intellectual, Donald Goellnicht begins his study from the premise that Keats's seven years of apprenticeship and formal training as an apothecary and surgeon could not have gone unmarked in Keats's brief poetic career. It is a logical premise but one that could be—and has often been—overlooked by literary scholars who have no background in the sciences, the history of science, or the history of the health professions. Goellnicht brings all these dimensions to his reconsideration of Keats's poetry The result is not so much a new understanding of Keats's work but an enriching of that understanding Learning of the changes taking place within the training and practice of surgeons and apothecaries in Keats's day gives us a strong sense that Keats, at least initially, was agreeable to the profession recommended for him by family and friends. Knowing the vocabulary and theories of, particularly, early nineteenth-century chemistry and anatomy offers a much clearer understanding of many of Keats's metaphors and illuminates many passages in Keats's earlier poetry, when he was still close to his medical studies. Goellnicht is perhaps weakest in attributing Keats's preference for experience over hypothesizing and his keen powers of observation to one of his anatomy professors, the famous Astley Cooper, but the proselytizing manner in which Cooper's lectures repeatedly argue these points suggests at least a strong sympathy between student and teacher. Goellnicht carefully uses the terms "adapt" and "influence," however, in talking about the relationship of Keats's medical training to his poetry, and is quick to point out existing uncertainties about which lectures Keats did actually hear and how closely he followed some of his teachers. Goellnicht's vivid picture of Keats's duties as a dresser at Guy's and the hospital's commitment to the needs of the poor, however, plus his thorough knowledge of the scientific milieu that would have surrounded Keats in his work and study, argue strongly for a reconsideration of the effect of Keats's studies at Edmonton and London on the language of his poetry as well as Keats's broader view of the poet as healer *The Poet-Physician* is a valuable supplement to any study of Keats It augments existing analyses of Keats's poetry and gives a more realistic consideration of the importance of a large period in Keats's life on his emotional and intellectual development as a poet

Reviewed by SUZANNE POIRIER, Humanistic Studies Program, University of Illinois at Chicago, Chicago, Illinois.

HARVEY G. SIMMONS ***From Asylum to Welfare: The Evolution of Mental Retardation Policy in Ontario from 1831–1980.*** Ontario. National Institute on Mental Retardation, 1982 xv + 355 pp $24 00 (Can.). (paperbound)

From Asylum to Welfare is a useful contribution to a much neglected field, the history of social policy toward the mentally retarded Based on extensive research in the primary literature and secondary published sources, Harvey Simmons traces the treatment of the retarded in Ontario, Canada, against a broadly drawn Anglo-American backdrop. His study breaks the history of Ontario policy into three major phases. From 1831 to 1900, the retarded were treated only within the context of the province's facilities for the mentally ill, where they received care "separate from and unequal to that given the insane" (p. 28). The public felt little concern about the retarded, and policy formulation was left in the hands of a small group of asylum doctors and government officials.

Then in the early 1900s, the "menace of the feeble-minded" popularized by the eugenics movement focused new and often hysterical attention on the retarded, culminating in 1917 with the Royal Commission on the Care and Control of the Mentally Defective, which recommended, among other measures, compulsory institutionalization and sterilization of the retarded. But primarily due to fiscal conservatism, the Ontario government enacted few of the Commission's harsh proposals, beyond the addition of separate schools and laws regulating marriages for the retarded, little substantive change occurred until after World War II.

In the 1950s, a parents' movement devoted to better community-based services coincided with academic and journalistic attacks on institutions in general to produce a popular demand for "de-institutionalization" of the retarded. With new state funding, community services such as special classes, sheltered workshops, and group homes expanded rapidly in the 1960s and 1970s But institutions for the retarded did not disappear, due to resistance at several levels: from the institutions' staff and community supporters, from neighborhoods opposed to group homes; and from governmental officials with a strong pro-institution bias Simmons concludes that although the welfare model of community-based services has gained strength, the asylum model retains many adherents in the 1980s.

Readers should be forewarned that there is little explicitly *medical* history in Simmons's study, which he frankly presents as social policy history Moreover, in his efforts to convey the complexities of policy formation, he often succeeds only in being confusing. Still, for the patient reader, there is much of interest here about the interplay between custodial and educational ideals in caring for the retarded and the role of interest groups in making social policy. To cite one relevant example, U S historians who are used to emphasizing the negative consequences of decentralized state policies toward the mentally ill might well consider Simmons's argument that the extreme *centralization* of the Ontario system discouraged both innovation and community support for its mental institutions (pp. 141–42). The comparative focus on policies in England and the United States that Simmons maintains throughout the book is especially useful. Given the dearth of research on this topic, *From Asylum to Welfare* is a welcome contribution to our bookshelves.

Reviewed by NANCY TOMES, Department of History, State University of New York at Stony Brook.

GERALD N GROB. *Mental Illness and American Society, 1875–1940.* Princeton, New Jersey Princeton University Press, 1983. xiii + 428 pp. $25.00

This remarkable book is the sequel to *Mental Institutions in America. Social Policy to 1875,* published in 1973. Once again Gerald N Grob is astonishing in his capacity to present a clear, incisive and comprehensive history of American psychiatry without the bias of presentism. Nor is his objective approach dull. Rather the reader becomes fascinated as the ramifications of twentieth-century psychiatry gradually fall into place with the unfolding of each carefully organized and documented chapter One finishes with an overall understanding of what was formerly piecemeal information, and a substantial framework in which to fit the numerous, but disparate and less inclusive, other historical studies available.

This study does have limits Grob does not dwell on the internalist history of psychiatry, on changing and conflicting theories about the nature and cause of mental illness since, in his own words, "the focus of this book is upon the mental hospital as an institution, the relationship between patients and psychiatrists, and the development of social policy" (fn. p. 192). However, because he carefully mentions and makes the reader aware of major changes in psychiatric thinking, this book is better balanced than most institutional and social histories

Without resorting to polemics or castigating any particular interest group, Grob analyzes the sequence of events and decisions that ultimately led to the rejection of the concept of institutional care for the mentally ill after 1940 He demonstrates that no particular group concerned with the hospitalized mentally ill determined this outcome, if only because none had the unrestricted power or opportunity to shape policy He emphasizes that the patients themselves were most important agents of change, because those committed to hospitals came to represent an older, more senile, less curable population than that for which the institutions had originally been designed. Concurrently, psychiatrists, whose base of operations in the nineteenth century had been the asylum, began in the twentieth to find greater professional satisfaction working in the emergent outpatient departments, psychiatric wards of general hospitals, and in community practice. The prevention of mental illness, rather than the care of those already seriously afflicted, also became the mission of the National Committee for Mental Hygiene, formed in 1909, even though its founder, Clifford Beers, had originally intended to promote hospital reform. The same period witnessed the emergence of new mental health professions including psychiatric social work, clinical psychology and occupational therapy These new groups also shifted attention away from mental hospital patients to new target populations in outpatient departments and in the community Private foundations lent their active support to preventive movements. Funding and control of state hospitals also distracted attention from patient care. State officials wanted accountability while psychiatrists fought for autonomy, so that the organization of institutions became the main concern.

In the first two chapters Grob describes the state of mental hospitals and of American psychiatry in the last decades of the nineteenth century. He then discusses the transformation of psychiatry at the end of the century to meet criticism, especially from neurologists, that the discipline was stagnant and backward-looking. The response entailed a shift from hospital management and patient care to a more "scientific" psychiatry involving the analysis of disease and its pathology The fourth chapter addresses the various systems tried by the states to organize mental hospitals. Grob points out that state acceptance of full fiscal responsibility encouraged local officials to redefine insanity to include aged and senile people who had previously been cared for in the community or in almshouses As the number of aged Americans also gradually increased in relation to the rest of the population, mental hospitals began to house elderly, disabled and incurable patients to a far larger extent than in the nineteenth century. The fifth chapter discusses the theoretical and practical changes in early twentieth-century psychiatry, and the sixth describes the emergence of the mental hygiene and the eugenics movements

Next comes an analysis of the behavioral peculiarities and disorders exhibited by twentieth-century mental hospital patients Far more were incurable than in the nineteenth century, yet psychiatrists continued to stress the primary importance of therapy "The disjuncture between image and reality would ultimately have a profound impact upon mental hospitals, for it would call into doubt their very legitimacy" (p 200)

Grob then discusses the organization of state mental hospitals in the twentieth century and the emergence of non-medical mental health professions At first these were harmonious with psychiatry but rifts developed as the newer professions encroached on previously uncontested medical territory Psychiatrists responded by reorganizing themselves and the training programs for new recruits. Grob suggests that the more psychiatrists identified themselves with the larger medical profession the less they were prone to act as the representatives of the institutionalized mentally ill. The final chapter addresses the interwar period, including a description of novel medical therapies and problems of evaluation

In the epilogue, Grob concludes that by the 1950s mental hospitals could be indicted as dehumanizing and unnecessary (in view of the new drugs and therapies available) without serious consideration of the effects of closure on the lives of former patients. For, by this time, most of the concerned parties, with the exception of patients themselves, had lost sight of the original function of mental hospitals as simply to care for people who were otherwise helpless outcasts.

This overview cannot do justice to the wealth of information and interpretation presented by Grob. Criticism has been muted because it is hard to imagine a richer history of modern institutional psychiatry within the confines of a 300-page book. Some readers may disagree over matters of emphasis or exposition but all will appreciate the clarification of recent psychiatric history this book represents

Reviewed by ELIZABETH M. LOMAX, Division of Medical History, Department of Anatomy, University of California, Los Angeles, California

KARL SABLIK. ***Julius Tandler: Mediziner und Sozialreformer.*** Vienna: A. Schendl, 1983. 389 pp. Ill. DM98,00; AS648,00

There are many diverse ways of writing a biography Moreover, the choice of a "great man" worth being thoroughly studied is not always easy. Not all the personalities whose names have been preserved in subsequent generations are worth a biography, whereas many lesser known scientists have had a life rich in events that deserve being fully detailed. This is the case for Julius Tandler (1869–1936), the Viennese anatomist and public health reformer His name does not appear in Garrison's textbook, although his magnum opus, the *Lehrbuch der systematischen Anatomie* (4 vols., 1918–29) is cited in Garrison and Morton's *A Medical Bibliography*. To a certain extent, Tandler's multi-faceted activity could be paralleled by that of Rudolf Virchow Both had a strong interest in anatomy, in anthropology, in sanitation and social reform and—last but not least,—in politics. But Tandler, unlike Virchow, left few pupils of international fame. Of Jewish origin, as was his teacher Emil Zuckerkandl, and many of his pupils, Tandler was baptized at the age of thirty—the year of his *Habilitation* (Privat-Dozent) in anatomy.

Julius Tandler followed his teacher Zuckerkandl in the first chair of anatomy in 1910, his colleague in the second chair being Ferdinand Hochstetter. In the fatidic year of 1914 he was elected Dean, in which office he succeeded Richard Paltauf. He had to cope with the rather problematic task of being "Kriegsdekan" for three years He was among the numerous Viennese opponents of Robert Bárány, who had won the Nobel Prize in 1914, and would not even grant him a full professorship! More meaningful for the understanding of Tandler's personality are his memberships in both Freemasonry and the Social Democratic Party Although he always remained an outsider in the Party and had several times to suffer as a "Jew" from fanatical members of his own political group, he remained faithful to it for many years, as it supported his efforts toward social reform. He was—for the same reasons—a member of the Vienna town-council for several years and even undersecretary of state and director of the Health Office for a year and a half

Among the many reforms in public health that he promoted, and achieved with a noted energy and stubbornness, those which were devoted to the young should be underlined. He developed a public Kindergarten; built up a much admired foundling home (1925), which was once ranked the first in the world for its range and organization; a famous castle was turned into a Kinderheim (Wilhelminenberg); he developed school hygiene (1921) and later headed an international committee in this field at the League of Nations in Geneva (1930) He developed professional counselling (1922) and educational institutes for problem children (Eggenburg). The two existing children's hospitals were placed under public tutorship. Tandler also developed consultations for mothers and organized a public diaper service (Säuglingswäsche-paket)

Obviously, Karl Sablik has worked very thoroughly and scrutinized the manifold activities of Tandler, always giving his sources One would have appreciated an appendix with a list of Tandler's publications (although the books appear in the bibliography) The pages of the book are very full and even crammed (narrow margins, fifty-two lines per page), but the text, references and index have been very carefully reviewed.

This book is particularly useful for anybody studying the development of public health in Vienna (or in Austria) in the years 1900 to 1930, but may also serve as a model of how to write a thorough biography without being boring It is, incidentally, a definitive biography of Julius Tandler

Reviewed by SAMUEL S. KOTTEK, Harry Friedenwald Chair of the History of Medicine, Hebrew University-Hadassah Medical School, Jerusalem, Israel.

JOHN GRIBBIN and JEREMY CHERFAS *The Monkey Puzzle: Reshaping the Evolutionary Tree.* New York. Pantheon Books, 1982. 280 pp. Ill. $13.95.

This book is an account of recent work in molecular biology pertaining to the evolution of the human species It focuses on research by Vincent Sarich and Allan Wilson, who developed a technique for determining when lines split, based on the measurement of differences in blood proteins between existing species Their refinement of the "molecular clock" led them to conclude that the human, chimpanzee, and gorilla lines split less than five million years ago. Their conclusion, published in 1967, contradicted the paleontological estimate of twenty million years and was for several years ignored by most paleontologists and anthropologists. Gribbin and Cherfas try to account for this neglect in terms of the conservatism of the scientific community and in the process they champion Sarich and Wilson as neglected heroes of science.

The slow response to Sarich and Wilson is compared here to the dull response accorded to Darwin's and Wallace's first presentation of their theory to the Linnean

Society in 1858. It becomes clear by the end of the book, however, that Gribbin and Cherfas are trying to conjure up a controversy where there was none. In fact the new timetable appears to have been fairly quietly announced and the initial skepticism of paleontologists has gradually eroded as the methods went through necessary refinements and extensions. The comparison to the Darwinian case is meant to encourage the reader to see this story as potentially revolutionary, but the story itself does not support this image.

As a popular account, the book ranges widely and digresses often with historical asides on past theories about the earth's history and human development. The fast pace makes for superficial treatment at times. Science and popularization are mixed indiscriminately: the ideas of popularizers such as Robert Ardrey and Elaine Morgan are discussed as seriously as more rigorous scientific ones An account of human development through neoteny fails to mention Stephen Gould's thorough treatment of the subject in his *Ontogeny and Phylogeny,* though the discussion in this book reads as though it were cribbed from Gould. The section dealing with efforts to teach apes a language seems to have been thrown in for its sensational value, but is not really germane to the book's main argument and could have been omitted.

Though the discussion of the molecular evidence is fairly detailed, the authors fall short when writing about paleontology Their book deals with an important subject, namely, the problem of making a convincing historical argument for evolution: does one accept the fossil record as primary, or does one look first to the genetic material of species alive today? The authors lament the difficulty of convincing paleontologists that temporal historical reconstructions can be done without their aid. But rather than explore the historical and philosophical context, they tend to dismiss the paleontological side of the argument This attitude comes through in their treatment of recent theories in paleontology: the theory of punctuated equilibrium, for instance, is dispatched in a few paragraphs It will likely be incomprehensible to anyone unfamiliar with the primary literature.

This book may be useful to students as a general introduction to modern work in evolutionary molecular biology and it will give them some idea of the conservative nature of science. But the material is presented rather like a stew, with various ingredients mixed up and heavily spiced with controversial claims. The lay reader for whom the book is intended will be apt to find the result indigestible.

Reviewed by SHARON E. KINGSLAND, Department of History of Science, The Johns Hopkins University, Baltimore, Maryland.

ALLEN B. WEISSE *Conversations in Medicine.* New York: Columbia University Press, 1984. xiii + 443 pp. $25.00.

Allen B. Weisse, a cardiologist and professor of medicine at the New Jersey Medical School, has provided us with a useful, and at the same time, a fascinating book. As the title implies, he has chosen, quite arbitrarily but astutely, to interview sixteen physicians, most of them well known and all of whom have done very interesting work. Fourteen of the physicians are men, two are black, and all but Sir George Pickering are Americans or working in this country

Weisse himself writes very clearly. His introductions to each interview are good historical summaries of the particular field being discussed. The book also has a very useful biographical appendix. Some of Weisse's questions and asides seem a bit unsophisticated and occasionally there are errors in the names or spelling of names, but these are only minor annoyances in a book that is both fun and profitable to read Besides, Weisse knows a great deal more about contemporary medicine and medical science than most of us, so we can perhaps allow him a few inconsequential lapses

Those of us writing about the history of twentieth-century medicine need more books like this one, not because they will contain much "hard" data, but because they say so much about the context of recent medical practice and research. Thus we learn about the feelings of a pioneer cardiac surgeon, Dr Charles Bailey, about the war-time experiences and later the problems of a medical innovator, Dr. Willem Kolff, of the problems in a new school of medicine from Drs Louis Goodman and Maxwell Wintrobe; of the life of an academic woman-physician in the middle decades of this century from Dr Marian Ropes; of the anti-Semitism in academic medicine from Dr. Arthur Kornberg, and the problems of the head of a research unit that has to deal with a case of fraud in science from Dr Robert Good All these are but a part of what these interviews reveal. From Good, for instance, we learn much about developments in immunology, and from Louis Weinstein a great deal about the treatment of infectious diseases

All in all then, a rich source for the historian I hope Weisse will publish another such volume because it says much about one aspect of the culture of medicine. We need other oral historians to interview some average doctors to capture their perceptions about the changes in twentieth-century medicine as well.

Reviewed by GERT H. BRIEGER, Institute of the History of Medicine, The Johns Hopkins University, Baltimore, Maryland

JOAN S EMMERSON (comp) ***Catalogue of the Pybus Collection of Medical Books, Letters and Engravings (15th–20th Centuries) Held in the University Library, Newcastle-upon-Tyne.*** Manchester, England and Dover, New Hampshire: Manchester University Press, 1981 xiv + 270 pp. £45 00, $60 00

Frederick Charles Pybus was a prominent surgeon in the north of England and Professor Emeritus at Newcastle University, his friends knew that he was also a scholar and collector of rare medical books He died, aged ninety-two, in 1975, having ten years earlier given to his University the collection of books, autographs and engravings whose wealth is described here in great detail Newcastle, long a pioneer in library technology, has had the Catalogue prepared by computer; it was compiled by Joan Emmerson while she was the University's Medical Librarian and Keeper of the Pybus Collection, and well known for her activity in national library cooperation, before her recent retirement In her introduction to the Catalogue, she describes with good humor the frustrations her team encountered in translating Pybus's handwritten cards into computer form and back into print while computers were rapidly changing and improving. The printed Catalogue vindicates her achievement through the detail recorded and the indexes generated, but it is not a handsome book in format, paper or type, though in interest and utility most welcome. As she points out, "added authors, editors and translators" are conveniently removed from the main catalogue to a "literary index," with further indexes for printers and publishers by name and location, and for the separate catalogues of autographs, special bindings and portraits.

Pybus naturally concentrated his collecting on surgery and its specialties, including treatment of the eyes, ears, and teeth; he owned copies of many famous books, including the great anatomical atlases and kindred treatises by great artists—Durer, Michelangelo, and Rubens among them But he cast his net wide over classical, Arabic and medieval writings, he acquired, most interestingly, a fourteenth-century manuscript of the English surgeon, John Arderne, in Latin with passages in French For his favorite authors—Harvey, Sydenham, the Hunters, Jenner, Lister—he amassed long series of editions, some minor writings, and numerous portraits. He collected early periodicals, and from the Renaissance onwards included extra-medical scientific books of great interest, Hooke and Darwin for instance John Hunter's pupils, the great surgeons of Regency London are here, and representatives of the famous Dublin "school," but he neglected the writings of his contemporaries and immediate predecessors; or did he consider them ineligible for his "historic" library? Yet he included socio-medical documents such as the Anatomy Act of 1832, and the Beveridge Report of 1948, the manifesto of the "welfare state" in its campaign against want, hunger and disease, now being wilfully dismantled. The Pybus Collection has given Newcastle University comparability in this field with the famous personal collections incorporated in the library of its foster parent at neighboring Durham, this Catalogue is a worthy and indispensable accession to the long shelf of similar records.

Reviewed by WILLIAM LEFANU, formerly Librarian of the Royal College of Surgeons of England, London.

BOOK NOTES

W R. LEFANU (comp) ***British Periodicals of Medicine: A Chronological List, 1640–1899*** (revised edition) Edited by Jean Loudon. Oxford: Wellcome Unit for the History of Medicine, 1984 xi + 67 pp. $5.00 (paperbound)

"British Periodicals of Medicine A Chronological List" was compiled by W R. LeFanu at the request of Fielding Garrison and first published in 1937 in the *Bulletin of the History of Medicine,* then reissued in book form in 1938. This is a reprint of Part I of that list with a page of corrections, seven pages of "Additions" (seventy-three new titles), and a title index to the additions.

The original list consists of 712 titles arranged chronologically, each title being entered at its year of first publication. The earliest publication date in the original list is 1684, in the "Additions," 1640. There is a title index to both lists, and the location of copies, if found. Although similar lists had been published for Australia, Canada and many other countries, this was the first survey of medical periodicals for England or for the British Empire as a whole Not just a finding guide, this list traces the evolution of medical periodicals and is still very useful for medical historical research.

LYDIE BOULLE, MIRKO D GRMEK, CATHERINE LUPOVICI and JANINE SAMION-CONTET (comps) ***Laennec: Catalogue des manuscrits scientifiques.*** Paris Masson, 1982. 316 pp. F200,00 (paperbound)

Through the continued care of his descendants, the literary legacy of the great clinician-anatomist René-Théophile-Hyacinthe Laennec was preserved intact and then deposited in what is today the Musée Laennec in Nantes. This *fonds* is both rich and diverse, including especially clinical and autopsy reports, sketches for various lecture courses and a number of miscellaneous and personal items Other Laennec manuscripts of importance (for example, the original version of the *Mémoire sur l'auscultation* and lecture notes on pathological anatomy) are preserved in other depositories All of this material has been scrupulously analyzed and is now catalogued and described by Lydie Boulle and her associates This work of several hands is a model of the genre, offering full details where so often a mere entry line is given. It is the indispensable introduction to an extraordinarily valuable, yet to date little used, collection of documents, documents pertaining to one of the central figures in the Paris school of medicine, a physician of outstanding accomplishment and of almost unparalleled influence.

CHRISTIANE GROEBEN (ed) ***Charles Darwin (1809–1882)—Anton Dohrn (1840–1909): Correspondence.*** Naples. Gaetano Macchiaroli, 1982 118 pp. Ill

This interesting correspondence deals above all with promotion, with Anton Dohrn's remarkable and ultimately successful effort to create a marine laboratory dedicated to the most advanced biological research, and operating on a truly international scale Dohrn was himself an accomplished zoologist and, through his father, began with good connections in many lands He soon made contact with Charles Darwin and elicited his influential name, as well as generous financial contributions, in support of the new Naples Zoological Station. The thirty-seven letters (seventeen from Darwin, twenty from Dohrn) reproduced here all appear in the original English and cover the period from November 1867 to February 1882. The center of attention is always the famous Zoological Station which gradually took form after 1870, but there is also much discussion of [Dohrn's] scientific work and the activities of other zoologists across Europe The correspondence provides, too, an invaluable portrait of international scientific networks in operation in the late nineteenth century. The editor has added abundant and very useful annotations to the letters and a short bibliography of items dealing with Dohrn and the Zoological Station.

DEAN CONRAD ALLARD, JR. ***Spencer Fullerton Baird and the U.S. Fish Commission.*** New York: Arno Press, 1978 xii + 424 pp $25 00

Spencer Fullerton Baird was a conspicuous member of a new species, the scientist-bureaucrat in mid-nineteenth-century America A very capable zoologist, he was also at home cultivating political relationships and exploiting his connections to the immense advantage of his science. The central figure in the United States Fish Commission, Baird became the master of all public initiative regarding the exploitation, increase and preservation of marine biological resources, and a primary stimulus in the creation of a sustained program, based upon both Federal and private support, of general biological research, Woods Hole, Massachusetts, as a center for such work, arose primarily from Baird's efforts. Dean Allard provides a comprehensive view of Baird's scientific studies and public career, the Fish Commission deservedly receiving pride of place. The volume is a photo-reproduction of Allard's doctoral dissertation (1967) and in its new form is welcome indeed. It affords an excellent portrait of the origins of government science in the United States, a useful view of the American biological community in the post-Civil War years and a valuable introduction to a much neglected but critically important scientific domain, fishery biology and related economic and ecological questions.

CHARLES G. ROLAND and PAUL POTTER (comps.) ***An Annotated Bibliography of Canadian Medical Periodicals, 1826–1975.*** Toronto: Hannah Institute for the History of Medicine, 1979. xvii + 77 pp.

This bibliography is based on H. Ernest MacDermot's *A Bibliography of Canadian Medical Imprints, with Annotations* which was published in 1934. The list corrects the errors in that book and continues the bibliography from 1934 to 1975.

The arrangement is alphabetical and many entries are annotated. The editors are noted with their dates and the inclusive dates of their editorship. The location for each journal is given or, if no copy has been found, there is reference to information about the journal. There is also a chronological index (by decade), a geographical index (by province, then city) and an index of editors. Most of the journals in this list published to 1910 have been published in microfiche by the Hannah Institute for the History of Medicine.

THE BULLETIN RECENTLY RECEIVED*

G. C. Ainsworth *Introduction to the History of Plant Pathology* Cambridge and New York: Cambridge University Press, 1981 xii + 315 pp Ill. $70 00.

Elizabeth H. Boone (ed.). *Ritual Human Sacrifice in Mesoamerica· A Conference at Dumbarton Oaks, October 13th and 14th, 1979* Washington, D C.. Dumbarton Oaks Research Library and Collection, 1984 viii + 247 pp

Allan M. Brandt. *No Magic Bullet A Social History of Venereal Disease in the United States Since 1880.* Oxford and New York· Oxford University Press, 1985. 245 pp Ill. $19.95.

Robert F. Bud and Gerrylynn K. Roberts *Science versus Practice. Chemistry in Victorian Britain* Manchester, England: Manchester University Press, 1984. 236 pp. £25.00.

Frank D Campion. *The A.M.A. and U S Health Policy Since 1940* Chicago: Chicago Review Press for the American Medical Association, 1984. ix + 603 pp. $25 00

Francesco Cordasco (comp) *American Medical Imprints, 1820–1910. A Checklist of Publications Illustrating the History and Progress of Medical Science, Medical Education, and the Healing Arts in the United States A Preliminary Contribution* Foreword by James Tait Goodrich. 2 vols Totowa, N.J.: Rowman and Littlefield, 1985. 1,654 pp $245.00 (set).

A. Corradi. *Le Prime Farmacopee Italiane ed in particolare dei Ricettari Fiorentini* (facsimile of 1887 edition). With a bibliography by A. Giordano. Milan: Ars Medica Antiqua Editrice, 1984 (Bibliografie di medicina antica, no 2) 146 pp $34.00 (paperbound)

Harris L. Coulter and Barbara Loe Fisher *DPT A Shot in the Dark.* San Diego, New York and London: Harcourt Brace Jovanovich, 1985. xiii + 431 pp $19 95

Elisabeth Crawford. *The Beginnings of the Nobel Institution The Science Prizes, 1901–1915* Cambridge and New York: Cambridge University Press, Paris: Editions de la Maison des Sciences de l'Homme, 1984 ix + 281 pp $34 50

Salvatore De Renzi and Baudry de Balzac (comps.). *Regimen Sanitatis Salernitanum. A Bibliography, 1474–1888* (reprint edition). Revised and edited by Gorgias Gambacorta and Alberto Giordano Milan· Ars Medica Antiqua Editrice, 1983 (Bibliografie di medicina antica, no. 1). 136 pp. $27.00 (paperbound)

Derek A. Dow *The Rottenrow The History of the Royal Maternity Hospital, 1834–1984.* Carnforth, Lancs.: Parthenon Press, 1984. 207 pp. Ill. $18.00. (Order from Parthenon Press, Casterton Hall, Kirkby Lonsdale, Carnforth, Lancs. LA6 2LA, England, U.K.).

John Duffy. *The Tulane University Medical Center One Hundred and Fifty Years of Medical Education* Baton Rouge and London Louisiana State University Press, 1984. xiv + 253 pp $22.50.

Margot Edwards and Mary Waldorf *Reclaiming Birth. History and Heroines of American Childbirth Reform.* Trumansburg, N Y: The Crossing Press, 1984. xi + 223 pp $19.95 (cloth); $8 95 (paperbound).

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*The *Bulletin* reserves freedom of decision as to the publications to be included in this section Items received, other than those reviewed, are ultimately incorporated into the collection of the Institute of the History of Medicine

Willis J. Elwood and A. Félicité Tuxford (eds.) *Some Manchester Doctors A Biographical Collection to Mark the 150th Anniversary of the Manchester Medical Society, 1834–1984.* Manchester, England and Dover, N H.: Manchester University Press for the Manchester Medical Society, 1984. xii + 228 pp $24.50

Olivier Faure. *Genèse de l'hôpital moderne. les hospices civils de Lyon de 1802 à 1845.* Lyon Presses Universitaires de Lyon, 1985; Paris: Editions du CNRS, 1982 269 pp. F90,00.

Gösta Forssells. *Från Gösta Forssells och den svenska röntgenologiens ungdomstid (From the Youth of Gösta Forssell and the Early Days of Swedish Roentgenology)* Edited by Wolfram Kock with Gunnel Nicou. Stockholm. Museum of Medical History, 1984 (Supplement to *Nordisk Medicinhistorisk Årsbok,* no. 10) 85 pp. (paperbound)

Charlotte Führer. *Mysteries of Montreal Memoirs of a Midwife* Edited by W. Peter Ward. Vancouver· University of British Columbia Press, 1984 170 pp. $19 95 (Can.); $US16.50.

Galen on the Doctrines of Hippocrates and Plato Third Part. Commentary and Indexes Edition, translation and commentary by Phillip De Lacy Berlin· Akademie Verlag, 1984. 220 pp M65,00.

Gesnerus Wolfgang Pauli and Philosophy; Aux origines du CERN, Die Entdeckung der unsichtbaren Strahlen des Sonnenspektrums (vol. 41, nos. 3/4). Aarau, Switzerland: Verlag Sauerlander, 1984 160 pp. (paperbound).

Isabelle Grellet and Caroline Kruse. *Histoires de la tuberculose les fièvres de l'âme, 1800–1940* Paris: Editions Ramsay, 1983 332 pp. F145,00 (paperbound)

Marie Boas Hall. *All Scientists Now. The Royal Society in the Nineteenth Century.* Cambridge and New York. Cambridge University Press, 1984 xii + 261 pp. $49 50.

Ronald Hamowy *Canadian Medicine. A Study in Restricted Entry* Vancouver and Toronto. Fraser Institute, 1984. xxii + 394 pp. $14.95 (Can) (paperbound).

Sabine Heller *Boerhaaves Schweizer Studenten. Ein Beitrag zur Geschichte des Medizinstudiums.* Zurich: Juris Druck, 1984 (Zürcher Medizingeschichtliche Abhandlungen, new series, no 169). 111 pp Sw Fr 32,00 (paperbound)

Peter Heusser *Der Schweizer Arzt und Philosoph Ignaz Paul Vital Troxler (1780–1866): Seine Philosophie, Anthropologie und Medizintheorie* Basel and Stuttgart· Schwabe, 1984 (Basler Veröffentlichungen zur Geschichte der Medizin und der Biologie) xvi + 350 pp. Sw Fr 38,00, DM46,00

Hippocrate. *Du régime.* Edition, translation and commentary by Robert Joly with the collaboration of Simon Byl Berlin: Akademie Verlag, 1984 332 pp M98,00.

Elisabeth Kaufmann *Gustav Jaeger, 1832–1917· Arzt, Zoologe und Hygieniker* Zurich: Juris Druck, 1984 (Zürcher Medizingeschichte Abhandlungen, new series, no. 171). 67 pp. Sw. Fr. 17,00 (paperbound).

Yvonne Knibiehler and Catherine Fouquet *La femme et les médecins analyse historique* Paris: Hachette, 1983. 333 pp. F85,00 (paperbound).

Liselotte Kuntner. *Die Gebärhaltung der Frau Schwangerschaft und Geburt aus geschichtlicher völkerkundlicher und medizinischer Sicht.* Munich· Hans Marseille, 1985 205 pp. DM48,00 (paperbound).

E. James Lieberman. *Acts of Will: The Life and Work of Otto Rank.* New York: The Free Press, 1985. xxxix + 485 pp. $24.95.

Theodore R. Marmor. *Political Analysis and American Medical Care. Essays.* Cambridge and New York Cambridge University Press, 1983 xix + 268 pp. $34.50 (cloth); $12 95 (paperbound).

William F. May *The Physician's Covenant. Images of the Healer in Medical Ethics* Philadelphia Westminster Press, 1983. 204 pp. $10.95 (paperbound).

Max Meyerhof. *Studies in Medieval Arabic Medicine. Theory and Practice.* Edited by Penelope Johnstone London: Variorum Reprints, 1984. 366 pp. £28.00.

Nordisk Medicinhistorisk Årsbok, 1984 (Yearbook of the Museum of Medical History of Stockholm). Edited by Wolfram Kock. Stockholm Museum of Medical History, 1984. 183 pp. (paperbound)

Ann Oakley. *The Captured Womb A History of the Medical Care of Pregnant Women* Oxford and New York: Basil Blackwell, 1984 352 pp $16 95

Donald V. Osier and Robert H. Wozniak (comps.). *A Century of Serial Publications in Psychology, 1850–1950 An International Bibliography* Millwood, N.Y Kraus International, 1984. xxxiii + 805 pp. $100.00.

Per-Gunnar Ottosson *Scholastic Medicine and Philosophy. A Study of Commentaries on Galen's Tegni (ca 1300–1450)* Naples Bibliopolis, 1984. 322 pp.

Dorinda Outram *Georges Cuvier. Vocation, Science and Authority in Post-Revolutionary France.* Manchester, England: Manchester University Press, 1984. 299 pp. £25.00.

Charles G. Roland (ed.). *Health, Disease and Medicine: Essays in Canadian History* (Proceedings of the First Hannah Conference on the History of Medicine, June 3–5, 1982) Toronto: Clarke Irwin for the Hannah Institute for the History of Medicine, 1984. 464 pp. $21.95 (Can.) (cloth); $9 95 (Can) (paperbound)

Charles G Roland (comp) *Secondary Sources in the History of Canadian Medicine. A Bibliography.* Waterloo, Ontario Wilfrid Laurier University Press for the Hannah Institute for the History of Medicine, 1984. xxiii + 190 pp. $20.00 (Can.).

David Warren Sabean. *Power in the Blood Popular Culture and Village Discourse in Early Modern Germany* Cambridge and New York. Cambridge University Press, 1985 x + 250 pp $29 95

Rose-Marie Scherrer. *Friedrich Hoffmanns Anweisung zu gesundem langen Leben, verglichen mit Hufelands Makrobiotik.* Zurich. Juris Druck, 1984 (Zurcher Medizingeschichtliche Abhandlungen, new series, no. 170). 47 pp. Sw. Fr. 14,00 (paperbound)

Heinrich Schipperges. *Historische Konzepte einer Theoretischen Pathologie Handschriftstudien zur Medizin des späten Mittelalters und der frühen Neuzeit* Berlin-Heidelberg-New York-Tokyo. Springer-Verlag, 1983. 116 pp. Ill.

Hans Joachim Schwanitz *Homoopathie und Brownianismus, 1795–1844: Zwei wissenschaftstheoretische Fallstudien aus der praktischen Medizin* Stuttgart and New York. Gustav Fischer Verlag, 1983 (Medizin in Geschichte und Kultur, no. 15). 202 pp. DM48,00 (paperbound).

Sefer Hanisyonot. The Book of Medical Experiences Attributed to Abraham ibn Ezra Edited, translated and commented by J O Leibowitz and S. Marcus. Jerusalem: The Magnes Press, Hebrew University, 1984. 345 pp. $28.00.

Strascino Campana Senese. *Lamento di Quel Tribulato di Strascino Campana Senese sopra el Male Incognito el Quale Tratte de la Patientia et Impatientia* (facsimile of 1523 edition). Introduction by Gorgias Gambacorta Milan: Ars Medica Antiqua Editrice, 1979 (Raccolta di antichi documenti medici, no 1). 97 pp. $17.00 (paperbound).

Mateo Seoane. *Mateo Seoane y la introducción en España del sistema sanitario liberal (1791–1870).* Edited and annotated by J. M. López Piñero. Madrid: Ministerio de Sanidad y Consumo, 1984 (Colección textos clásicos españoles de la salud publica, no. 12). 239 pp. (paperbound) (Order from Servicio de Publicaciones del Ministerio de Sanidad y Consumo, Paseo del Prado, 18, Madrid-14, Spain)

Richard B. Sheridan. *Doctors and Slaves: A Medical and Demographic History of Slavery in the British West Indies, 1680–1834.* Cambridge and New York: Cambridge University Press, 1985. xxii + 420 pp. $42.50

Šarka Škoda. *Selbstdarstellungen von Geisteskranken und Süchtigen in der schönen Literatur seit 1900.* Zurich: Juris Druck, 1985 (Zürcher Medizingeschichtliche Abhandlungen, new series, no. 173). 75 pp. Sw. Fr. 19,00 (paperbound)

Gisela Maria Stutz. *Zur Geschichte der Zürcher Zahanärztegesellschaft.* Zurich: Juris Druck, 1984 (Zürcher Medizingeschichte Abhandlungen, new series, no. 172). 76 pp. Sw. Fr. 19,00 (paperbound).

Thirty Books in the Library of the Los Angeles County Medical Association. A Compendium of Medical History. Los Angeles: Friends of the LACMA Library, 1984. 134 pp. Ill. $77.00 (Order from Friends of the LACMA Library, 634 South Westlake Avenue, Los Angeles, California 90057).

Peter L. Tyor and Leland V. Bell. *Caring for the Retarded in America. A History.* Westport, Conn.: Greenwood Press, 1984 (Contributions in Medical History, no. 15). xvi + 215 pp. $29.95

Hendrika Vande Kemp with H. Newton Malony (comps.). *Psychology and Theology in Western Thought, 1672–1965: A Historical and Annotated Bibliography.* Millwood, N.Y.: Kraus International, 1984. xiv + 367 pp. $65.00.

Ivan Waddington. *The Medical Profession in the Industrial Revolution.* Dublin: Gill and Macmillan; Atlantic Highlands, N.J.: Humanities Press, 1984. xi + 236 pp. $36.00

Robert Woods and John Woodward (eds.). *Urban Disease & Mortality in Nineteenth-Century England.* New York: St. Martin's Press, 1984. 255 pp. $27.50.

CONTRIBUTORS TO THIS NUMBER

EUGENE DECLERCQ, Ph.D., is an associate professor in the Department of Political Science, Merrimack College, North Andover, Massachusetts 01845 His research focuses on maternal and child health policy and he is currently writing a book on the history of midwifery in Massachusetts.

RICHARD LACROIX is a graduate of Merrimack College and is privately employed.

PETER D. OLCH, M D., is an associate professor in the section of medical history at the Uniformed Health Services University. His research interests include frontier medicine and the history of surgery. His address is Section of Medical History, USUHS School of Medicine, 4301 Jones Bridge Road, Bethesda, Maryland 20814

GUENTER B. RISSE, M.D , Ph.D, formerly professor, Department of the History of Medicine, University of Wisconsin, will soon assume his new duties as professor and chairman, Department of the History and Philosophy of Health Sciences, University of California, San Francisco, California 94143 His recent researches into eighteenth-century clinical records will be published shortly by Cambridge University Press as *Hospital Life in Enlightenment Scotland Care and Teaching at the Royal Infirmary of Edinburgh.* He is now completing a book-length manuscript on the Brunonian reform movement in Europe and America.

BARBARA GUTMANN ROSENKRANTZ, Ph.D., is professor and chairman of the Department of the History of Science and a member of the faculty in the School of Public Health, Harvard University She teaches an undergraduate course entitled "The Conquest of the Great White Plague," and is presently writing a book on the influence of private foundations on community medicine and public health between the two world wars. Her address is Department of the History of Science, Science Center 235, Harvard University, Cambridge, Massachusetts 02138

JOHN HARLEY WARNER, Ph.D., is a fellow at the Wellcome Institute for the History of Medicine, 183 Euston Road, London NW1 2BP, England, for the academic year 1984–85. While at the Institute, he is working on a comparative study of the transmission of early nineteenth-century Parisian medicine to Britain and the United States. He is completing a book on *The Therapeutic Perspective. Medical Practice, Knowledge, and Professional Identity in America, 1820–1885.*

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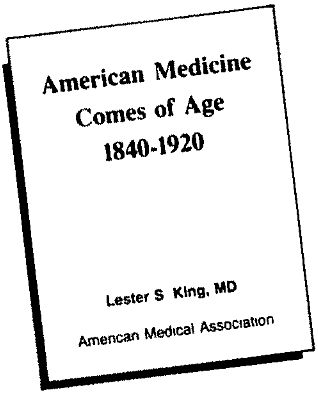

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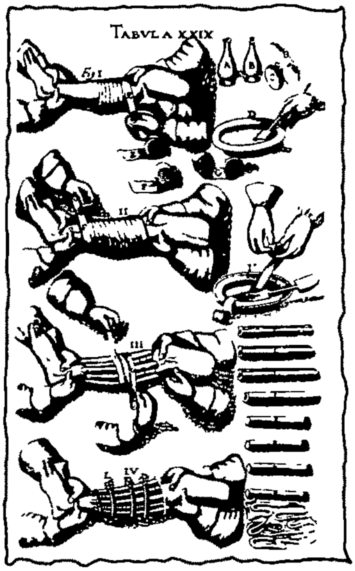

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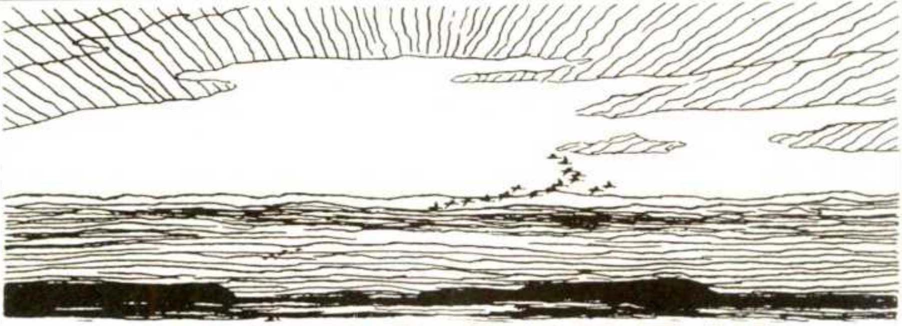

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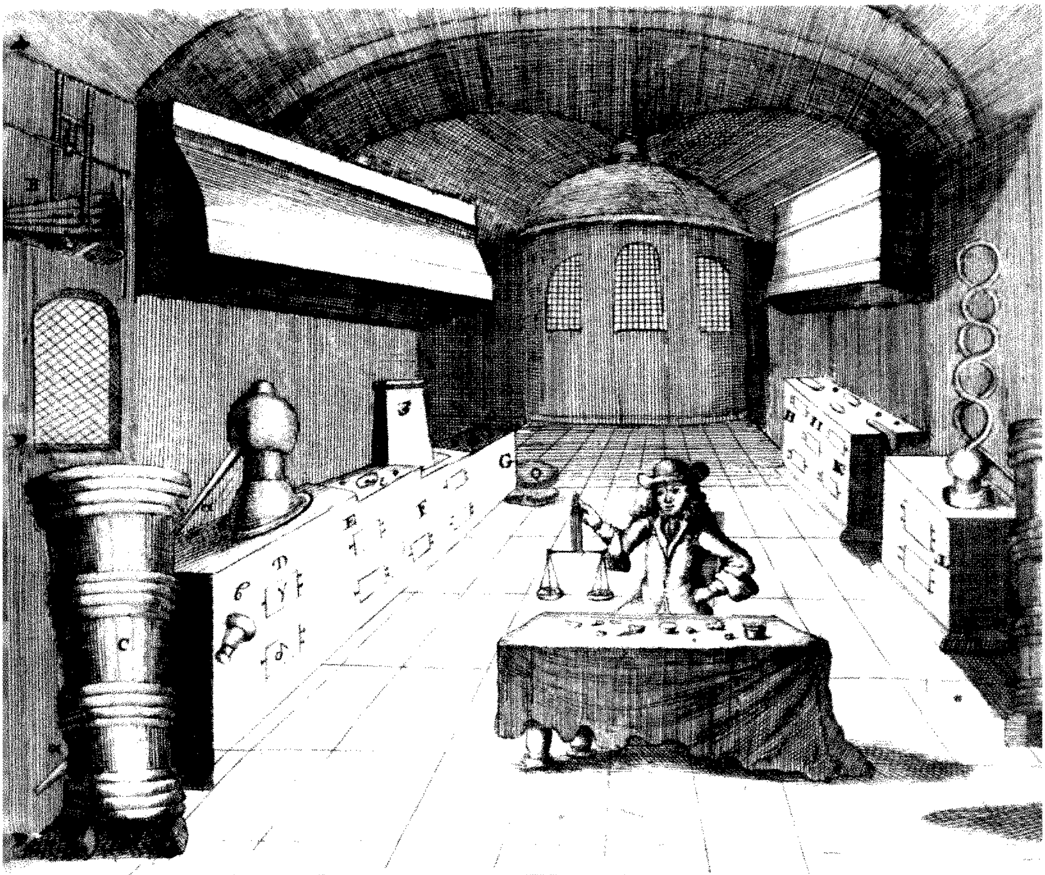

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WILLIAM OSLER MEDAL ESSAY

THE DEVELOPMENT OF THE FROZEN SECTION TECHNIQUE, THE EVOLUTION OF SURGICAL BIOPSY, AND THE ORIGINS OF SURGICAL PATHOLOGY

James R. Wright, Jr.[*]

During the late nineteenth and early twentieth centuries, clinicians had few tools other than the patient's history and physical examination to aid them in the diagnosis of cancer. Often, by the time a tumor could be diagnosed clinically, it was inoperable. As early diagnosis was the key to surgical cure, surgeons exposed and examined any potentially malignant tumor. Even when this was done, it was not always apparent from the gross appearance of a lesion whether it was benign or malignant, and the surgeon often had to proceed on the basis of his experience, knowing that the result of an incorrect diagnosis could be unnecessary disfigurement or death for the patient. Many surgeons preferred to err in favor of more radical procedures. As Joseph C. Bloodgood, associate professor of surgery at the Johns Hopkins Hospital, wrote in 1904, "In regard to tumors .. lynch law is by far the better procedure than 'due process.' "[1]

Since the turn of the century, however, marked changes have occurred in surgical diagnosis, particularly in the area of the histologic diagnosis of benign and malignant tumors. At present, a biopsy with a rapid frozen section diagnosis is a standard diagnostic tool for the surgeon who is uncertain of the nature or extent of a lesion he has exposed surgically. With this technique, the surgeon can often have a definitive histologic diagnosis within minutes, while the patient is still on the operating table.

How did this change in surgical diagnosis come about? None of the numerous general histories of surgery and pathology have examined the

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[*] I wish to express my gratitude to my graduate advisor John C Burnham for the tools that enabled me to write this essay

[1] Joseph C. Bloodgood, "The relation of surgical pathology to surgical diagnosis," *Detroit Med J*, 1904, *3* 337–52, esp p 338 General sources on the history of cancer include Lelland J Rather, *The Genesis of Cancer A Study in the History of Ideas* (Baltimore The Johns Hopkins University Press, 1978), Michael B Shimkin, *Contrary to Nature. Being An Illustrated Commentary on Some Persons and Events of Historical Importance in the Development of Knowledge Concerning Cancer* (Washington, D C United States Department of Health, Education, and Welfare, 1977), Sigismund Peller, *Cancer Research Since 1900 An Evaluation* (New York. Philosophical Library, 1979), Daniel De Moulin, *A Short History of Breast Cancer* (Dordrecht and Boston Martinus Nijhoff Publishers, 1983)

Bull Hist Med, 1985, *59* 295–326

development of the quick frozen section technique.[2] This paper will discuss the coming into use and acceptance of the frozen section as a technique for rapid diagnosis during an operation. It will also show how the adoption of frozen section techniques resulted in the increased use of biopsies and examine the effect of the frozen section technique on the evolution of surgical pathology as a subspecialty.

Nineteenth-Century Developments. A combination of three developments in the middle and late nineteenth century made rapid tissue diagnosis during operations possible by the beginning of the twentieth century. First, the introduction of anesthesia and aseptic technique allowed surgeons to perform longer, more complicated procedures requiring improved diagnostic skills. Second, the resolution and magnification capabilities of the microscope were increased as a result of technical innovations such as the Abbé condenser and the achromatic lens. Third, techniques for the preparation of tissue specimens for microscopy were improved. The relationship between this third development and the frozen section technique requires that a few principles related to these advances in histologic technique be outlined.

A key to histologic and cytologic fidelity in microscopy is the preparation of thin and uniform tissue sections. As most tissues are soft, some method of hardening the tissue is needed. One of the earliest hardening techniques, dating from the early nineteenth century, was freezing the tissue in a saline solution.[3] This was a simple method but it resulted in cell shrinkage and poor retention of cellular detail; it was soon replaced by procedures in which the tissue was embedded in a matrix such as paraffin or celloidin before being sectioned. Earlier hardening of the tissue (fixation) and dehydration were required to ensure satisfactory results. Once the tissue was properly hardened, sections were cut and stained to elicit nuclear and cytoplasmic detail. Before the 1870s, sections were usually cut freehand with a razor, but in the late nineteenth century, mechanical aids called microtomes were developed, improving both the quality of sections and the speed at which they could be produced.[4]

Despite the replacement of frozen sections by various embedding techniques, the technology for producing frozen sections continued to improve throughout the later nineteenth century Specimens were no longer frozen in brine and ice solutions prior to being placed on the microtome; instead, they were placed on the microtome and then frozen with compressed carbon dioxide, ether spray, or other gases.[5] A sampling of late nineteenth-century textbooks on the methods and techniques of microscopy and pathology demonstrates that the frozen section still had its uses.[6] Most authors described one or more methods of making frozen sections, although most qualified their descriptions with statements that the technique produced results that were not always satisfactory. Writing in 1901, W. M. Late Coplin, professor of pathology at Jefferson Medical College in Philadelphia, observed:

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[2] Esmond R. Long, *A History of Pathology* (Baltimore Williams & Wilkins, 1928), Edward B Krumbhaar, *Pathology* (New York Hoeber Clio Medica, 1937), Esmond R Long, *A History of American Pathology* (Springfield, Ill. Charles C Thomas, 1962), Harvey Graham, *The Story of Surgery*, 2nd ed (New York Doubleday, Doran, 1939), Richard A. Leonardo, *History of Surgery* (New York Froben Press, 1943), Leo M. Zimmerman and Ilza Veith, *Great Ideas in the History of Surgery*, 2nd rev ed. (New York Dover Publications, 1967), Owen H Wangensteen and Sarah D. Wangensteen, *The Rise of Surgery from Empiric Craft to Scientific Discipline* (Minneapolis University of Minnesota Press, 1978)

[3] Long, *History of Pathology*, pp 211–14, Clarence B Farrar, "The growth of histologic technique during the nineteenth century," *Rev Neurol Psychiat (Edinb)*, 1905, *3* 501–13

[4] George Clark and Frederick H Kasten, *History of Staining*, 3rd ed (Baltimore Williams and Wilkins, 1983) Brian Bracegirdle, *A History of Microtechnique* (Ithaca, New York Cornell University Press, 1978) is the best source on the development of microscopic technique, but he does not include the clinical or pathological applications for the innovations

> After using the freezing method to a very large extent for about ten years, the author is thoroughly convinced that it is not to be relied upon The ice crystals that form in freshly frozen tissue break up the cells and give results that may mislead the most experienced investigator . and . . . have led me to give them up entirely for laboratory work; only the crudest kind of pathologic work can be performed by the freezing and congelation methods at present at our disposal, and the results are always open to criticism[7]

Although described in textbooks of microscopy by 1890, the use of frozen sections for the diagnosis of tissue during operations required further refinement of the techniques. The need for improved surgical diagnosis and the increasing commercial availability of freezing microtomes was to lead to widespread experimentation by surgeons and pathologists.

Thomas S. Cullen at the Johns Hopkins Pathology Laboratory During the early 1890s, pathologists experimenting at the Johns Hopkins and other laboratories were attempting to develop a quick and practical method for hardening tissue that would not distort cell morphology and would permit tissue diagnosis during operations. In Baltimore in 1891, William H. Welch made a frozen section of a breast tumor while William S. Halsted operated, but it took Welch so long that the operation was completed before the microscopic diagnosis was finished.[8] Later that year, Thomas S. Cullen, a recent medical graduate of the University of Toronto, came to Welch's laboratory to study pathology for several months before starting an internship in gynecology After completing his internship and a European tour, Cullen returned to Welch's laboratory. He supervised gynecological pathology for three years while he waited for a vacancy in the Hopkins gynecology residency program. Like Welch, he experimented with frozen sections for rapid diagnosis. Frozen sections had been used at least occasionally by William T. Councilman during autopsies at Hopkins, and it is likely that Cullen learned the technique from him.[9]

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[5] Bracegirdle, *History of Microtechnique*, pp 135–209

[6] Charles H Stowell and Louisa R. Stowell, *Microscopical Diagnosis* (Detroit: George S Davis, 1882), pp 17–18, Carl Friedlaender, *A Manual of Microscopic Technology for Use in the Investigations of Medicine and Pathological Anatomy*, trans Steven Y Howell (New York. G P Putnam's Sons, 1885), p 22, Francis Delafield and T Mitchell Prudden, *A Handbook of Pathological Anatomy and Histology with an Introductory Section on Postmortem Examination and the Methods of Preserving and Examining Diseased Tissues* (New York William Wood, 1885), p 40, Frank L. James, *Elementary Microscopical Technology A Manual for Students of Microscopy. Part I The Technical History of a Slide from the Crude Materials to the Finished Mount* (St. Louis, St. Louis Medical & Surgical Journal, 1887), pp 18–19, Heneage Gibbes, *Practical Pathology and Morbid Histology* (Philadelphia. Lea Brothers, 1891), pp 37–40, Frank J Wethered, *Medical Microscopy A Guide to the Use of the Microscope in Medical Practice* (Philadelphia. P Blakiston's Son, 1892), pp 31–35, 55–56

[7] W M Late Coplin, *Manual of Pathology Including Bacteriology, the Technic of Postmortems, and Methods of Pathologic Research* (Philadelphia P Blakiston's Son, 1901), pp 62–63

[8] Joseph C. Bloodgood, "Biopsy in diagnosis of malignancy," *Southern Med J*, 1927, *20* 18–28, esp p 23

Cullen studied pathology in Germany for five months in the laboratory of Johannes Orth during his European trip in 1893, the year that the fixative properties of formaldehyde were first reported. Orth advocated the use of formalin and developed a formalin-based fixative, "Orth's fluid." As a result, Cullen was familiar with and impressed by the properties of formalin, as one of his memos reveals:

> Formalin, formaldehyde, and formol are looked upon as synonymous terms. Formalin was first used by Blum of Frankfurt a[m] M[ain] in 1893 as a preservative for goldfish, frogs, mice, etc The animals were not only well preserved but the colors were retained Since then Hermann, Hoyer, and others have used it for histological purposes. The tissues hardened in this fluid are little if at all contracted. Accordingly the cells are in no way distorted but stand out with great distinctiveness. While working with formalin specimens it occurred to me that it might be of use in the preparation of frozen sections [10]

Cullen found that frozen sections, if fixed in formalin for three to five minutes, could be "treated as an ordinary celloidin section, being stained and mounted in the same way."[11] This procedure took only fifteen minutes and thus permitted Cullen to make diagnoses while operations were in progress. Welch was so impressed when shown the new technique that he told Cullen to write a report of his findings immediately, and it was published in the April *Bulletin of the Johns Hopkins Hospital.*[12] Although the *Bulletin* had already gone to press, it was feared that another pathological laboratory might publish similar findings in the month preceding the next issue, and it was for this reason that special arrangements were made to publish the report immediately.[13] At the same time, Cullen published a description of the technique in a German journal.[14]

When asked later about this discovery, Cullen replied·

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[9] Judith Robinson, *Tom Cullen of Baltimore* (London Oxford University Press, 1949), pp 83–84

[10] Notes on Cullen's Formalin Method, n d, Item 103, Thomas S Cullen Papers, The Alan Mason Chesney Medical Archives, The Johns Hopkins Medical Institutions, Baltimore, Maryland

[11] Thomas S Cullen, "A rapid method of making permanent specimens from frozen sections by the use of formalin," *Bull Johns Hopkins Hosp*, 1895, *6* 67. The article was reprinted verbatim in *ibid*, 1897, *8* 108–9

[12] Cullen, "Rapid method," p 67

[13] Robinson, *Tom Cullen of Baltimore*, pp 120–22

[14] Thomas S Cullen, "Beschleunigtes Verfahren zur Farbung frischer Gewebe mittelst Formalins," *Zentralbl Allg Path Anat*, 1895, *6* 448–50

> It was a great thing for a young fellow, to gain recognition by his work and to be first in a race where all started even, but beyond that was the chance that your discovery might help another man to his. My method of making permanent specimens, for instance; it was no time at all after I published before other men had improved on it, worked out methods of doing the same thing faster and more effectively and, just as I had used earlier findings in my work, they used mine in theirs.[15]

Although Cullen was the first to publish a description of a technique for producing rapid diagnostic frozen sections, it is unclear whether he was the first to use them.[16]

The Development of the Frozen Section in Germany. Henrique Plenge of the Pathological Anatomy Institute at Heidelberg and Ludwig Pick of the Landau Frauenklinik in Berlin both published accounts of similar techniques in 1896. Plenge insisted that he had discovered the technique, had used it since October of 1894, and had demonstrated it to some of his colleagues.[17] Pick asserted that his technique had been "used in the laboratory of the Landau Frauenklinik for some time," but credited Cullen with its development. He observed that, "Plenge employed it later, tested it thoroughly, and gave a description of the results obtained "[18]

All three men recognized the significance of their discoveries. Cullen published descriptions of his technique three times, twice in the United States (the second time because he had run out of reprints) and once in Germany; Plenge published descriptions twice in Germany; and Pick published descriptions twice in Germany, once in the United States, and once in Britain.[19]

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[15] Robinson, *Tom Cullen of Baltimore,* pp 121–22

[16] John Collins Warren, "The early diagnosis of malignant growths," *Trans Amer Surg Assoc*, 1889, *7* 9–24 Warren, a surgeon at the Massachusetts General Hospital, described a method for punch biopsies and mentioned that the specimens were sometimes examined immediately "with the freezing microtome," but did not describe his technique Therefore, Warren's contribution to the development of the frozen section technique was minimal and he was never cited in the literature pertaining to frozen sections Furthermore, neither the 1894 nor the 1900 edition of his textbook, *Surgical Pathology and Therapeutics,* described frozen section technique, although both include sections describing "scientific aids to surgical diagnosis " See John Collins Warren, *Surgical Pathology and Therapeutics* (Philadelphia W B Saunders, 1894), pp 807–8, *idem, Surgical Pathology and Therapeutics,* 2nd ed (Philadelphia W B Saunders, 1900), pp 795–96 In 1895, Nicholas Senn, chairman of surgery at Rush Medical College in Chicago, suggested that "the freezing microtome should have a place in the operating room of every hospital " Nicholas Senn, *The Pathology and Surgical Treatment of Tumors* (Philadelphia W B Saunders, 1895), p 107 Senn, like Warren, made a vague suggestion rather than describing a technique Although both Warren and Senn probably made use of frozen sections during operations, at least occasionally, before Cullen, Cullen was the first to publish practical step-by-step instructions for making such sections His technique was recognized at a meeting of the New York Pathological Society on 28 January 1898 as the first successful frozen section technique see Eugene Hodenpyl, "A modification of Cullen's method of preparing fresh frozen sections for microscopic work," *Med Rec*, 1898, *53* 351

[17] Henrique Plenge, "Zur Technik der Gefrierschnitte bei Hartung mit Formaldehydlosung," *Virchow's Arch*, 1896, *144* 409–31, *idem,* "Hartung mit Formaldehyd und Anfertigung von Gefrierschnitten, eine fur die Schnelldiagnose ausserst brauchbare Methode," *Münch med Wochnschr*, 1896, *43* 71–72

[18] Ludwig Pick, "A rapid method of staining and preparing tissue for microscopical diagnosis," *Amer J Obstet*, 1896, *34* 839–43 The quotation is on pp 839–40

[19] Ludwig Pick, "II Eine weitere Abkurzung der Schnellanfertigung mikroskopischer Dauerpraparate (Anwendung formalinisirter Farbstofflosungen)," *Zentralbl Gynak*, 1898, *22* 227–31, Pick cites a second German reference within this paper, Ludwig Pick, "A rapid method of preparing permanent sections for microscopical diagnosis," *Brit Med J*, 1897, *1* 140–41

Plenge's persistent attempts to claim credit for the discovery indicate his belief that it was important. Pick, who had never claimed priority, was offended when Cullen asserted that Pick had not arrived at his discovery independently, but had only adapted Cullen's method.[20] According to Cullen, the "slight modification ... recently suggested by L. Pick ... I cannot recommend. When first experimenting with formalin ... I tried staining the sections ... as Pick now suggests, [but] abandoned it and did not think it worthy of publication."[21] In light of this dispute, it is ironic that it is none of the principals but rather Louis B. Wilson of the Mayo Clinic who is generally remembered as the originator of the rapid diagnostic frozen section.[22]

The Development of the Frozen Section in Great Britain. There is evidence that two British pathologists may have made frozen section diagnoses during operations as early as 1897. Alfredo A. Kanthack, deputy professor of pathology at Cambridge University and pathologist at St. Bartholomew's Hospital, and T. Strangeways Pigg published an account of their technique in that year.[23] It consisted of first dropping the tissue specimen into boiling water for three to five minutes, then placing it on a freezing microtome, cutting frozen sections, staining, and mounting them as if they were paraffin sections. Preparation of a specimen generally took ten to fifteen minutes. The authors stated that they had "considerable experience" with the method and that it could be used "to make rapid diagnoses for the operating theatre and the post-mortem room."[24] This technique never reappeared in the literature and there is little evidence to suggest that it was used extensively for diagnosis in the course of operations.

The first well-documented use of frozen sections during operations in Great Britain was in early 1899. The pathologist Ernest H. Shaw and the surgeon Charles Barrett Lockwood developed their technique at the Great Northern Central Hospital in London.[25] Little is known about Shaw, but Lockwood was a four-time Hunterian professor at the Royal College of Surgeons; former president of the Anatomical Society, the Medical Society of London, and the Harveian Society of London; and consulting surgeon to St. Bartholomew's Hospital.[26] Lockwood had been routinely using frozen sections for diagnosis since 1899 but he did not publish a description of the technique until 1904 when his lecture, "Early microscopical diagnosis of tumours" was printed in the *British Medical Journal*.[27] It is possible that Lockwood was simply unconcerned about receiving credit for the discovery, but it is more likely that he knew that others had published their results before him, particularly since Pick had published his article in the *British Medical Journal* in January 1897. Lockwood never acknowledged a source for his idea of using frozen sections for diagnosis during operations, and it is possible that he developed it independently. Irrespective of this, Lockwood was probably the first general surgeon to employ diagnostic frozen sections routinely. Cullen, Plenge, and Pick used their techniques primarily for gynecological surgery.

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[20] Pick, "Weitere Abkurzung," esp p 228

[21] Cullen, "Rapid method," footnote p 109

[22] Helen Clapesattle, *The Doctors Mayo* (Minneapolis University of Minnesota Press, 1941), pp 242–46, C. Alexander Hellwig, "Biopsy in tumors," *Arch Path*, 1932, *13* 607–53, esp p 621; Waltman Walters, "Early interest in general surgery," *Proc Mayo Clinic*, 1964, *39* 656–61, esp. p 657, Paul Starr, *The Social Transformation of American Medicine* (New York Basic Books, 1982), p. 210, Joseph C Bloodgood, "Biopsy in diagnosis of malignancy," pp 18–28, esp p 23

[23] Alfredo A. Kanthack and T Strangeways Pigg, "Boiling water as a fixative and hardening agent—the revival of an old histological method for rapid diagnosis," *Trans Path Soc London*, 1897, *48* 279–82

[24] *Ibid*, p 279

[25] Ernest H Shaw, "The immediate microscopic diagnosis of tumours at the time of operation," *Lancet*, 1910, *2* 939–42, Charles B. Lockwood, *Cancer of the Breast An Experience of a Series of Operations and Their Results* (London Henry Frowde, Hodder & Stoughton, 1913), pp 79–107

[26] Eric C O Jewesbury, *The Royal Northern Hospital, 1856–1956 The Story of a Hundred Years' Work in North London* (London H K. Lewis, 1956), "Charles Barrett Lockwood, F.R.C.S Eng," *Lancet*, 1914, *2* 1217–18

The Shaw-Lockwood technique differed in that formalin was not used. Apparently Shaw had worked at a hospital in which all tissue specimens, both from operations and autopsies, were regularly prepared as frozen sections after they had been hardened in alcohol or Müller's fluid.[28] After years of experience, Shaw could produce good sections in as short a time as two minutes. It is interesting to note that the Shaw-Lockwood technique, as described in 1904, utilized methylene blue, the stain that Louis B. Wilson reported a year and half later to be the key to his method.[29]

The Mayo Frozen Section Story. According to Helen Clapesattle, the technique of frozen sections during operations was developed by Louis B Wilson at the Mayo Clinic in 1905. Wilson had been hired in 1904, when the Mayos decided they needed a well-trained, full-time pathologist to organize and develop their pathology laboratory. By offering a larger salary, an unlimited laboratory budget, and academic freedom, the Mayos were able to attract to the position Louis B. Wilson, the assistant director of the bacteriological laboratory of the Minnesota State Board of Health. Wilson began his new duties on 1 January 1905. Later that month, William Mayo said to him, "I wish you pathologists would find a way to tell us surgeons whether a growth is cancer or not while the patient is still on the table."[30] Wilson realized that a quick method of hardening tissue specimens was needed for making rapid sections. He decided that the frozen section, distrusted by most tissue pathologists, might provide the solution, and he began to examine the literature and to experiment with the various published methods occasionally used in autopsy pathology.[31] None, however, provided differential staining that was adequate for surgical diagnosis.

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[27] Charles B Lockwood, "A clinical lecture upon the early microscopical diagnosis of tumours," *Brit Med J*, 1904, *2* 5–8

[28] Ernest H. Shaw, "The immediate microscopic diagnosis of tumours at the time of operation," *Lancet*, 1923, *1* 218–23

[29] Michael F Gavin, "The work in surgical pathology of the pathological and surgical departments," *Med Surg Rep Boston City Hosp*, 1900, *11* 158–72 The surgical pathology laboratory at Boston City Hospital under Frank B Mallory and William T Councilman (who had recently left Hopkins) was also using frozen sections stained with methylene blue prior to Wilson's discovery Gavin reported that frozen section diagnosis could be obtained in four minutes

[30] Clapesattle, *Doctors Mayo*, p 444

Wilson had been a high school biology teacher for eight years before entering medical school and had extensive experience with botanical techniques. He relied upon these skills in the development of his own method. He mounted tissue specimens in elder pith, placed them outside the window for a few minutes to freeze, cut sections freehand with a razor, stained them, and mounted them on glass slides with a glucose mixture used for botanical materials. He experimented with various stains until he settled upon methylene blue, a supravital (i.e., used on living cells) dye used in bacteriology and botany. Wilson was pleased by the cellular detail retained with this technique and attributed his success to the use of this stain. He purchased a freezing microtome to facilitate the preparation of his frozen sections. For several months, he practiced the technique and his diagnostic skills on normal and diseased fresh tissue. He compared his fresh tissue diagnoses with those obtained using ordinary methods. By the end of April, Wilson was diagnosing surgical specimens within five minutes of the time they were removed from the patient, and the Mayos were able to use these reports to guide them through difficult operations.[32]

On 2 December 1905, Wilson published an account of his work in the *Journal of the American Medical Association* [33] In his article, he stated that he had been using his new technique routinely on surgical specimens for six months with about the same diagnostic accuracy as with fixed tissue. The advantage of the new method was that "the whole process can be gone through in one and a half minutes from the time the tissue is placed on the freezing plate of the microtome until the stained specimen is on the stage of the microscope. The resulting coloring is uniformly good with the tissue elements sharply contrasted in red, purple, and dark blue."[34] This paper is commonly regarded as marking the beginning of tissue diagnosis during operations in surgical pathology.[35] Although Wilson never claimed priority for his idea, he also did not cite the contributions of others in assisting the development of his technique. Wilson's method was not the first frozen section technique, but it soon became the most widely known.

Distrust of the Frozen Section Technique Despite the efforts exerted in pathology laboratories in the United States to develop a rapid diagnostic tool, none of the methods described above had much immediate impact. Most of the authors of standard American textbooks of pathological techniques in the early twentieth century mentioned that they existed, but minimized their significance Francis Delafield and T. Mitchell Prudden's *A Handbook of Pathological Anatomy and Histology* included both Cullen's procedure and one of its modifications, but the authors concluded that the procedures took "a little more than an hour" and offered only "a fair chance for an early morphological diagnosis."[36] Aldred S. Warthin, in his *Practical Pathology for Students and Physicians* asserted that "stained sections may be had in a few minutes after removal of the tissue from the body" and that for "quick diagnostic work it has no equal It may with advantage form part of the fittings of an operating room and the material examined on the spot." But he qualified these comments by stating, "Its application is chiefly for quick and rough diagnostic work, and even here it is subject to certain limitations."[37] By the time the second edition of his text was published in 1911, his opinion was even more negative:

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[31] *Ibid*, p 445

[32] *Ibid*, pp 445–46 No archival records exist at the Mayo Foundation to document these events further

[33] Louis B Wilson, "A method for the rapid preparation of fresh tissues for the microscope," *JAMA*, 1905, *45:* 1737

[34] *Ibid*

[35] Hellwig, "Biopsy in tumors," p 621, Clapesattle, *Doctors Mayo*, pp 442–46, Walters, "Early interest in general surgery," p 657, Starr, *Social Transformation of American Medicine*, p 210, William J Mayo, "The story of the fresh frozen section," *Proc. Staff Meeting Mayo Clinic*, 1929, *4* 274–75

> It must be emphasized here that the process of freezing is an active one, and alters the relation of cell structures With many fresh tissues the changes resulting from the freezing are so great that no diagnosis can be made It seems necessary here to warn against the routine employment of the rapid method of freezing and staining fresh tissues in the diagnosis of material obtained by surgical operation It has become a fad with some surgeons to make a pathologic diagnosis by the freezing method while the patient is on the table Consequently as the result of diagnoses made by the rapid freezing and staining method, many mistakes are made, even by supposed experts in this line[38]

Other popular textbooks of pathological technique described one or more methods for making frozen sections but offered no insight into their usefulness for quick diagnosis. Wilson's fresh frozen section technique was conspicuously absent from these works, none of the standard pathology references even described it. Prior to 1925, few academic pathologists and none of the standard pathology textbook authors regarded the use of frozen sections during operations as an important technique[39] In fact, perhaps the only laboratory methods textbook strongly advocating quick diagnostic frozen sections was written specifically for general practitioners.[40]

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[36] Francis Delafield and T Mitchell Prudden, *A Handbook of Pathological Anatomy and Histology*, 6th ed (New York William Wood, 1901), pp 51–52

[37] Aldred S Warthin, *Practical Pathology for Students and Physicians* (Ann Arbor, Mich George Wahr, 1897), p 17

[38] Aldred S Warthin, *Practical Pathology for Students and Physicians*, 2nd ed (Ann Arbor, Mich George Wahr, 1911), pp 215–16

[39] Frank B Mallory and James H Wright, *Pathologic Technique A Practical Manual for Workers in Pathological Histology and Bacteriology Including Directions for the Performance of Autopsies and for Clinical Diagnosis by Laboratory Methods*, 7th ed (Philadelphia W B Saunders, 1918), pp 20–22, 33–35, Francis C Wood, Karl M Vogel, and Lemuel W Famulener, *Laboratory Technique* (New York. James T Dougherty, 1922), p 12, U S Surgeon-General's Office, *Laboratory Methods of the United States Army*, 2nd ed (Philadelphia Lea & Febiger, 1919), pp 61–64 John A. Kolmer and Frederick Boerner, *Approved Laboratory Technic Clinical Pathological, Bacteriological, Serological, Biochemical, Histological* (New York. D Appleton-Century, 1931), esp pp 612–14, was the first pathology methods textbook to describe Wilson's method. This book was prepared under the auspices of the American Society of Clinical Pathologists (discussed later), an organization in which Mayo Clinic personnel were very active The authors stated in the preface of their textbook that originally they had intended to omit histological methods but that "it is particularly gratifying to be able to include a chapter on Methods for the Microscopical Examination of Tissues by Dr William C MacCarty and Dr W L A. Wellbrook."

Promotional Efforts by the Mayo Clinic Personnel From about 1925 to 1935, a debate over the merits of the new frozen section technique was conducted in medical and surgical journals Wilson set the stage for this battle. In an attempt to gain recognition for his technique, he published a series of papers on frozen section diagnosis. His papers appeared in many regional, as well as various specialty, journals Wilson also presented or discussed his technique at many meetings of regional medical and surgical societies.[41]

Nor was Wilson the only physician describing his technique. Other pathologists and surgeons at the Mayo Clinic published articles endorsing the validity and importance of Wilson's procedure. For example, William C. MacCarty, head of the section on surgical pathology at Mayo after 1909, published more than a dozen articles relating to the topic. Another surgical pathologist at the Clinic, Albert C. Broders, also published a series of articles advocating this diagnostic tool. He developed a system for grading the severity of tumors from the frozen sections made, further enhancing the value of the technique by offering some insight into the patients' prognoses.[42] Even the renowned William J. Mayo added to this promotional effort by writing several favorable editorials.[43]

The early success of the Mayo Clinic has often been attributed to the ability of the Mayos to generate publicity. It is unlikely that many national or regional meetings at which surgical diagnosis or surgical pathology were discussed took place without a surgeon or surgical pathologist representing the Mayo Clinic. As late as 1953, a physician from the Division of Surgical Pathology at the Mayo Clinic was still publishing descriptions of its frozen section technique.[44] Moreover, thousands of domestic and foreign physicians who trained at the Mayo Clinic during the first third of the twentieth century carried away with them knowledge of Wilson's technique. Many Mayo alumni published articles or editorials supporting rapid frozen section diagnosis of biopsies[45] In addition, laboratory diagnosis was a common topic of discussion at weekly staff meetings, the proceedings of which were published for alumni. Therefore, the staff of the Mayo Clinic played a major role in the promotion of the frozen section technique.

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[40] Byron G R. Williams and Edwin G C Williams, *Laboratory Methods With Special Reference to the Needs of the General Practitioner*, 3rd ed (St. Louis C V Mosby, 1917), pp 78–82 Byron Williams was a general practitioner in Illinois and Edwin Williams was a former pathologist at the Northern Michigan Hospital for the Insane in Traverse City, Michigan

[41] Louis B Wilson, "The hospital laboratory with special reference to diagnosis in surgical cases," *St Paul Med J, 1910, 12* 233–38, *idem,* "The microscopic examination of fresh tissues for the diagnosis of early cancer," *St Paul Med J*, 1913, *15* 274–78, *idem,* "Laboratory efficiency," *Indianapolis Med J*, 1913, *16* 512–17, *idem,* "On staining fresh tissues for diagnostic purposes," *Internat Assoc Med Museums Bull*, 1915, *5* 105, *idem,* "Staining sections of living tissue, unfixed," *J Lab Clin Med*, 1915, *1* 40–45, *idem,* "Microscopic examination of fresh tissue, and necropsy service in relation to surgery," *Trans South Surg Assoc*, 1924, *37* 241–48, and *idem,* "Microscopic examination of fresh tissue, and necropsy service in relation to surgery," *Ann Surg*, 1925, *81* 863–68

[42] Mayo Clinic, Rochester, Minn , *Physicians of the Mayo Clinic and the Mayo Foundation* (Minneapolis University of Minnesota Press, 1937) See, for example, William C MacCarty, "The diagnostic reliability of frozen sections," *Amer J Path*, 1929, *5* 377–80, Albert C Broders, "The grading of cancer and its practical application," *Arch Path Lab Med*, 1926, *2* 376–81

[43] William J Mayo, "The diagnostic value of microscopic examination of fresh frozen tissue," *Surg Gynecol Obstet*, 1929, *49* 859–60 and Mayo, "Story of the fresh frozen section," pp 274–75

[44] Malcolm B Dockerty, "Rapid frozen sections technique of their preparation and staining," *Surg Gynecol Obstet*, 1953, *97* 113–20

Bloodgood Promotes the Frozen Section. According to his peers, Joseph Colt Bloodgood at Johns Hopkins was the individual most responsible for promoting the routine use of rapid frozen sections during operations,[46] and the timing of his journal discussions of the topic confirms this impression. Early in his career, Bloodgood advocated the "naked-eye" recognition of tumors in situ, was opposed to biopsies with frozen section diagnosis, and was ambivalent about frozen sections.[47]

In 1925, Bloodgood began a public reversal of his opinion concerning the necessity of biopsy with frozen section diagnosis.[48] In his address as chairman of the section on surgery of the Southern Medical Association in November 1926, he noted that in the past five years he had become increasingly dependent on the use of frozen sections in the operating room.[49] By early 1927, Bloodgood had begun an aggressive campaign to promote frozen section diagnosis as a routine procedure and a mandatory standard to which the surgical profession should adhere. He wrote editorials, letters to colleagues, and manuscripts; he made platform presentations, and personal demonstrations of the technique.

His campaign began with an editorial in *Surgery, Gynecology and Obstetrics* asking that any "pathologists and surgeons interested in the immediate examination of tissue by frozen section in the operating room" contact him. Identical editorials appeared in the *Atlantic Medical Journal,* the *Virginia Medical Monthly,* and *California and Western Medicine.* It was also submitted to the *American Journal of Pathology* but was rejected on the grounds that the journal did not print editorials.[50]

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[45] Byrd Charles Willis, "The importance of a positive diagnosis in surgery by means of frozen sections," *Trans Med Soc Virginia,* 1911, *42* 114–16, Byrd Charles Willis, "The importance of frozen section in surgery," *Southern Med Surg*, 1929, *91* 459–60, Pietro Frugoni, "In tema di cancro," *Archivio Ital Chir*, 1936, *44*. 577–88, Sidney J S Peirce, "On the technique of producing frozen sections for rapid diagnosis," *Internat Assoc Med Museums Bull*, 1915, *5* 106–8, William L A. Wellbrook, "The value of biopsy," *J South Carolina Med Assoc.,* 1932, *28* 79–80, Harold D Caylor, "The advantage of early examination of diseased tissue," *J Lab Clin Med*, 1928, *13* 708, Harold D Caylor and Truman E Caylor, "An apparatus to facilitate the preparation of fresh frozen sections," *J Lab Clin Med*, 1930, *16* 312–13, Harold D Caylor and Allen A C Nickel, "Technical considerations of fresh and fixed frozen sections," *Med J Rec*, 1932, *136* 339–40

[46] Hellwig, "Biopsy in tumors," pp 621–22, Walter M. Simpson, "The frozen section fetish," *Amer J Clin Path*, 1937, 7 96–102, esp p 102

[47] Bloodgood, "Relation of surgical pathology to surgical diagnosis," pp 337–52, *idem,* "Diagnosis and treatment of borderline pathological lesions," *Trans. Amer Surg Assoc* (*Phila*), 1913, *31* 356–92, *idem,* "Diagnosis of cancer," *Boston Med Surg J*, 1917, *176* 317–18

[48] Joseph C Bloodgood, "Prevention, diagnosis and treatment of cancer in its earliest stages," *Southern Med J*, 1926, *19* 287–92

[49] Bloodgood, "Biopsy in diagnosis of malignancy," p 23

In another editorial in *Surgery, Gynecology and Obstetrics,* Bloodgood attacked small hospitals that did not have pathologists and hospitals without facilities for frozen sections:

> It is time now for the [American] College [of Surgeons] and the surgeons to take up this problem. In every operating room in this country either these operations requiring frozen-section diagnosis should not be done and referred elsewhere, or that hospital or that group of hospitals in one locality should prepare for this frozen-section diagnosis Incomplete operation and delayed pathological diagnosis are dangers to the American public, and they are no longer necessary evils. This equipment should be part of the minimum requirements of every hospital in which operations of this character are performed[51]

Also in 1927, Bloodgood offered a blanket invitation to all of the readers of the *Journal of the American Medical Association* who were interested in learning about "tissue diagnosis in the operating room" to come to the Surgical Pathological Laboratory of the Johns Hopkins Hospital for a demonstration on the Saturday following the annual American Medical Association meeting in Washington.[52] Although no records of attendance exist, the demonstration must have been successful because he repeated the offer again in 1930, but this time for a three-day period, and by form letter invitation and reservation only Attendance was limited to forty persons per day, and participants were required to bring their own microscopes.[53] Thereafter, the demonstrations were offered several times yearly "through the generous financial aid of Francis P. Garvin, president of the Chemical Foundation."[54]

Bloodgood also published various papers dealing with the topic in both surgery and pathology journals. In an article in the *Southern Medical Journal* in 1928, Bloodgood asserted:

> To increase accuracy and diminish the element of error, the diagnosis of tissue in the operating room by any rapid method of cutting and staining must depend upon its routine employment, whether this is essential for diagnosis or not The method must not be used only as an emergency when diagnosis is essential When tissue diagnosis in the operating room is a routine instead of an emergency occurrence, then the element of error in the interpretation of a section

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[50] Joseph C Bloodgood, "Tissue diagnosis in the operating room and immediate cover-slip examination of all fluids and pus," *Surg Gynecol Obstet*, 1927, *44* 838, and also *Atlantic Med J*, 1927, *30* 386–87, *Virginia Med Month*, 1927, 805–6, *Calif West Med*, 1927, *26* 347 Frank B Mallory to Joseph C Bloodgood, 19 February 1927, Bloodgood to Mallory, 22 February 1927, Joseph C Bloodgood Papers, The Alan Mason Chesney Medical Archives, The Johns Hopkins Medical Institutions, Baltimore, Maryland

[51] Joseph C Bloodgood, "The danger of incomplete removal of small and apparently innocent lesions," *Surg Gynecol Obstet*, 1927, *44* 413–14

[52] Joseph C Bloodgood, "When cancer becomes a microscopic disease, there must be tissue diagnosis in the operating room," *JAMA*, 1927, *88* 1022–23

[53] Joseph C Bloodgood to Colleagues, 15 May 1930, Bloodgood Papers

[54] Joseph C Bloodgood, "Biopsy in the treatment of malignancy," *J Lab Clin Med*, 1931, *16* 692–703, esp p 701

> obtained in five or ten minutes is no greater than one obtained from a section carefully prepared with an interval of one or more days' delay… Tissue diagnosis in the operating room will have a very great educational value, if it is properly done All the surgeons in the operating room will have an opportunity to compare, in a very short time, clinical, gross and microscopic pictures[55]

Although Bloodgood felt very strongly that tissue diagnosis in the course of operations was necessary, he offered no firm opinion concerning which method was best. He stated that for many years he had used the method of boiling the tissue in formalin prior to cutting frozen sections, but, for the past several years, he had used the fresh frozen section stained with polychrome methylene blue. He also cited advantages of the methods of Terry, Shaw, and Dudgeon (discussed below). Finally, he suggested that, regardless of the method used, the operating room section should be checked later against a paraffin section.[56]

Bloodgood introduced the idea of placing the freezing microtome, slides, coverslips, fixatives, stains, and a two-headed microscope on a cart that could be rolled from one operating room to another. He suggested that this apparatus would save time, because the tissue specimen would not have to be carried to the laboratory. The portable apparatus, he pointed out, would also permit the surgeon to view the section "without impairing surgical cleanliness." This arrangement became known as "the Bloodgood portable frozen section table."[57]

In an editorial published in 1929, Bloodgood attributed his change in attitude concerning frozen section diagnosis to an enlightened public attitude toward cancer and a willingness to seek the surgeon's help earlier:

> Before 1915 it was rarely necessary for a surgeon well trained in gross pathology to need a frozen section to help him in diagnosis at the operating table Since 1915, and especially since 1922, the public has become so enlightened that malignant disease formerly easily recognized either clinically or in the gross, now appears in our operating rooms devoid of its easily recognized clinical and gross appearance and can be properly discovered only by an immediate frozen section.

He stated that the records at the Johns Hopkins Hospital indicated that prior to 1900 more than 50 percent of cancers were inoperable when diagnosed, whereas after 1920, this percentage had decreased to less than five.[58]

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[55] Joseph C Bloodgood, "Tissue diagnosis in the operating room," *Southern Med J*, 1928, *21* 179–84, esp pp 179, 182

[56] *Ibid*

[57] *Ibid.*, George S Foster, "The Bloodgood portable frozen section table," *Med Times Long Island Med J*, 1931, *59*. 111–12, Harold D Caylor and Truman E Caylor, "An apparatus to facilitate the preparation of fresh frozen sections," *J Lab Clin Med*, 1930, *16* 312–13, Arthur S Brumbaugh, "Technical difficulties in biopsy diagnosis," *Int J Med Surg*, 1933, *46* 484–85

[58] Bloodgood, "Tissue diagnosis in the operating room and examinations of fluids and pus," p 838 This statement, although certainly not true by today's standards, is typical of the optimism of many members of the surgical profession in the early twentieth century

Another factor affected Bloodgood's slow acceptance of the validity and importance of the frozen section technique. Bloodgood never recognized the fact that Thomas Cullen had developed the first technique for frozen section diagnosis during operations, though they were longtime friends. They had studied pathology together at Hopkins during the early 1890s and in Germany in 1893. Bloodgood and Cullen became directors of surgical pathology and gynecological pathology, respectively, at Hopkins. They were actively involved in educating the American public concerning cancer diagnosis and treatment through their activities in the American Society for the Control of Cancer. Yet Bloodgood credited Louis B. Wilson with developing the first useful frozen section technique In one of his papers, Bloodgood described the early history of the technique and noted that he had experimented with it himself after returning from Germany in 1893. In his account, Bloodgood fails to mention Cullen's 1895 paper and continued his brief history by describing this case:

> In 1896, at the invitation of Dr Weir, of New York, then Professor of Surgery at Columbia, I was present at a private operation, at which he explored and removed an encapsulated tumor of the breast. One of the best New York pathologists was present and made a frozen section It was Dr Weir's opinion that the tumor was a benign encapsulated adenoma. The pathologist was as firmly convinced that it was adenocarcinoma. Weir acted on his own diagnosis This case is recorded in my laboratory The patient whose breast was saved is living today.[59]

It is likely that the technique used in the operation was that of Cullen and that the pathologist's failure to make the correct diagnosis amused Bloodgood and prompted him to save the slide.[60]

It is apparent that Bloodgood and Cullen were competing to perfect a rapid frozen section technique and that Cullen won. Bloodgood, a surgeon, would not recognize this achievement of Cullen, a gynecologist, and minimized the significance of the frozen section for more than thirty years, maintaining that it was no better than naked eye diagnosis. Only in 1927 did Bloodgood finally admit its value and begin to promote the frozen section. The following letter from Cullen to Bloodgood, shortly after Bloodgood published his first two editorials promoting the frozen section technique, demonstrates Cullen's rebuttal of Bloodgood's selective memory:

> March 18, 1927
>
> My dear Joe,
>
> I am just in receipt of your letter of March 14th together with your letter of Feb. 3rd on Tissue Diagnosis in the Operating Room. I think it presents the subject very well There is only one thing that an objection might be raised to

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[59] Bloodgood, "Biopsy in diagnosis of malignancy," p 23

[60] Cullen's technique was well known to New York pathologists, see Hodenpyl, "Modification of Cullen's method," p. 351 Since Bloodgood was able to retain a permanent slide, the tissue was probably fixed in formalin (i e, Cullen's technique)

and that is the beginning of paragraph three where you say "Before 1915 it was rarely necessary for a surgeon well trained in gross pathology to need a frozen section to help him in diagnosis at the operating table." If you do not include gynecologists as surgeons then no objection could be raised, but if you do include them as surgeons frozen sections of scrapings have been carried out and have been deemed essential in our Department at least at Hopkins since 1896

With best regards and looking forward with pleasure to our trip on Monday,

Ever yours,
Thomas S. Cullen[61]

Improvements in the Frozen Section Technique Since medical personnel generally believed that the cytologic fidelity of frozen sections was inferior to that of paraffin sections, many dozens of technical improvements were reported in the literature. Although few of these modifications greatly affected the utility of the technique, their numbers show that considerable interest existed in improving diagnostic accuracy.

Cullen's formalin technique was soon replaced by a method first introduced by James Homer Wright of the Massachusetts General Hospital. Wright quickly fixed the fresh tissue by boiling it in formalin for several minutes before freezing it and cutting sections, a modification that greatly improved morphological definition.[62] Karl Walz introduced a similar technique, which he called the "Kochmethode," in 1919. Walz, a prosector at Katharinen Hospital in Stuttgart, Germany, stated that he had developed the method because of shortages of gas, electricity, and paraffin during World War I.[63] Many others recognized the importance of the quick fixation in hot formalin and adopted the procedure.[64] According to Leopold Reiner, a pathologist at Beth Israel Hospital in Boston, the prefixation in boiling formalin was, to his knowledge, "the most widely used rapid section technic among pathologists" in the United States.[65] Walz's "Kochmethode" was, on the other hand, the most popular technique in Europe.[66]

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[61] Thomas S Cullen to Joseph C Bloodgood, 18 March 1927, Bloodgood Papers

[62] James H Wright, "Eine schnelle Methode zur dauernden Aufbewahrung gefrorener Schnitte," *Zentralbl Allg Path*, 1901, *12* 634–35 Cullen's method was quickly forgotten. It was cited only once in the frozen section literature after 1901 Priority for Wright's method is generally attributed incorrectly to Karl Walz, see Karl Walz, "Ueber pathologisch-histologische Momentdiagnose," *Zentralbl Allg Path*, 1919, *30* 442–43

[63] Walz, "Ueber pathologisch-histologische Momentdiagnose" Walz's abstract does not state that his sections were cut on a freezing microtome In fact, it asserts that frozen sections are unreliable However, others using the "Kochmethode" call it a frozen section method.

[64] S Hoffheinz, "Zur Technik der histologischen Schnelldiagnose," *Zentralbl Chir*, 1927, *54(2)* 2498–501, Alphonse A. Thibaudeau, "The preparation and staining of frozen sections," *J Lab Clin Med*, 1933, *19* 204–9, Rutherford B H Gradwohl and Aram A. Krajian, "The frozen section method of tissue diagnosis the method of choice," *Gradwohl Lab Digest*, 1941, *4* 11–15, Eugene Hildebrand and Ester L Cheatle, "Frozen sections," *Amer J Clin. Path Techn. Sect*, 1946, *10* 69, Lester M Friedland, "A note on frozen section technic," *Amer J Clin Path*, 1951, *21* 797

[65] Leopold Reiner, "Principles of rapid frozen sectioning with a method of prefixation using undiluted formalin at 60° C," *Lab Invest*, 1953, *2* 336–48

[66] Hellwig, "Biopsy in tumors," pp 622–23, J Escalona Zapata, "La biopsia intraoperatoria. analisis critico," *Acta Oncol* (Madrid), 1968, *7* 229–37

Wilson's technique continued to be used at the Mayo Clinic and elsewhere essentially unchanged until 1931, when Albert C. Broders, director of the Mayo Clinic's surgical pathology section B after 1922, recommended modifying the mounting medium.[67] Wilson's method did have two major disadvantages. First, the staining characteristics of methylene blue were often unacceptable to those accustomed to examining hematoxylin and eosin stains in paraffin sections, because adjustment to an unfamiliar color scheme was required. Those willing to adapt suggested that comparing fixed frozen sections to those prepared by Wilson's method was like comparing raisins to grapes.[68] But the main problem with Wilson's technique was the impermanence of the rapid sections. Wilson used neither a fixative nor a permanent stain. As a result, the slides dried out in a few hours. James W Kernohan, a pathologist at the Mayo Clinic, further modified Wilson's method by sealing the edges of the cover slips with a quick-drying lacquer to slow the evaporation process, but this prolonged the life of the slide by at most several weeks.[69] Other changes were few. David C. Dahlin, a surgical pathologist at the Mayo Clinic, reported in 1980 that the technique used at the Clinic was essentially unaltered from that of Wilson[70]

The most significant technical advance in the preparation of frozen sections was suggested by Otto Schultz-Brauns of the Pathological Institute at the University of Bonn in 1931. Schultz-Brauns used compressed carbon dioxide not only to freeze the tissue, as many had done before, but also to cool the microtome knife to minus five degrees centigrade. As a result, sections were less likely to stick to the knife and could be attached to room temperature glass slides by merely touching the slides to the knife This eliminated two difficult tasks: first, removing each section from the knife with a camel's hair brush or glass rod and moving it through a series of fixatives, alcohols, water baths, stains, and so on, and, second, gluing each section to the glass slide after it had been stained. With this technique, even those with little manual dexterity could make good frozen sections[71] The obvious advantages of the Schultz-Brauns method led to its immediate widespread acceptance in Europe and at some American laboratories.[72] Surprisingly, when in 1947 Frank B Adamstone and Aubrey B. Taylor introduced a conceptually similar, but very cumbersome technique, it was received by some Americans as if they were totally unfamiliar with the Schultz-Brauns cooled knife method.[73]

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[67] Albert C Broders, "Modification of Wilson's fresh frozen section technic," *J Lab Clin Med*, 1931, *16* 734–38.

[68] C Alexander Hellwig, "Tissue diagnosis during operation reliability of Terry's supravital technique in 1030 biopsies," *Surg Gynecol Obstet*, 1935, *61* 494–98, esp pp 494, 496

[69] James W Kernohan, "Method of temporarily preserving fresh frozen sections stained with polychrome methylene blue," *Amer J Clin Path*, 1936, *6* 195

[70] David C Dahlin, "Seventy-five years' experience with frozen sections at the Mayo Clinic," *Mayo Clinic Proc*, 1980, *55* 721–23

[71] Otto Schultz-Brauns, "Eine neue Methode des Gefrierschneidens fur histologische Schnelluntersuchungen," *Klin Wochnschr*, 1931, *10* 113–16, *idem*, "Verbesserungen und Erfahrungen bei Anwendung der Methode des Gefrierschneidens unfixierter Gewebe," *Zentralbl Allg Path*, 1932, *54* 225–34, *idem*, "Histotopochemische Untersuchungen an krankhaft veranderten Organen unter Anwendung der Schnittveraschung," *Virchow's Arch*, 1929, *273* 1–50, *idem*, "Die Methode der Schnittveraschung unfixierter tierischer Gewebe," *Z Mikrosk*, 1931, *48* 161–91, *idem*, "Die Vorteile des Gefrierschneidens unfixierter Gewebe für die histologische Technik," *Zentralbl Allg Path*, 1931, *50* 273–77

Techniques Competing with the Frozen Section Method. Recognition of the value of tissue diagnosis during operations is suggested by the number of competing methods of making sections that were developed at the same time as the frozen section.[74] Pathologists recognized the major shortcomings of frozen section diagnosis; some tried to improve the method, while others designed alternative methods for rapid tissue diagnosis.

The most important of the competing techniques was the razor section method of Benjamin T. Terry, professor of pathology at Vanderbilt University. Terry had seen MacCarty demonstrate Wilson's fresh frozen section technique while visiting the Mayo Clinic in 1919. He was particularly impressed by the supravital properties of Unna's polychrome methylene blue stain. He was told that the World War had made it difficult to obtain this high quality stain from Germany Terry, who wished to use the stain in his laboratory work, was determined "to learn how to ripen" (i.e., polychrome) the generic methylene blue stain available in the United States He found that heating improved its staining qualities and published a description of his method in 1920, after which it was adopted at the Mayo Clinic.[75] Thus began a long and mutually beneficial relationship between Terry and the surgical pathologists at the Mayo Clinic

Terry continued to experiment with rapid diagnostic techniques and discovered that his polychrome methylene blue stain, when applied to a gross specimen, would allow him to see “a small area of malignancy contained in a larger mass of tissue that was not malignant.”[76] Since very small tumors could not be seen with the naked eye, Terry developed and improved a technique for the microscopic examination of biopsy specimens stained with his methylene blue.[77] The success of the technique in its final form was based on three characteristics: 1) the supravital properties of polychrome methylene blue previously noted by Wilson; 2) the absence of artifacts caused by freezing, fixing, boiling, or dehydrating the tissue; 3) the histologic detail provided by relatively thick sections stained superficially on one side only and examined microscopically with bright transmitted light C. Alexander Hellwig of Wichita described the third characteristic as follows: “Since only the upper cell layer is stained and the light is transmitted through the thick, unstained part of the tissue, one has the impression of seeing a perfectly thin microtome section.”[78]

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[72] S Zethraeus, "Modifikation der Schultz-Braunsschen Gefrierschnittmethode," *Ztschr Wissensch Mikr*, 1937, *54* 408–11, Escalona Zapata, "Biopsia intraoperatoria," pp 229–37, S Carl Werch, "The use of liquid air in cooling knives and of gelatin for mounting in frozen section technic," *J Lab Clin Med*, 1936, *21* 1309, Wilhelm C Hueper, "A simplification of the cooled knife method (Schultz-Brauns) for obtaining frozen sections," *Arch Path*, 1933, *16* 670–71

[73] Frank B Adamstone and Aubrey B Taylor, "A method for the rapid preparation of frozen tissue sections," *Anat Rec*, 1947, *99* 639, Frank B Adamstone and Aubrey B Taylor, "The rapid preparation of frozen tissue sections," *Stain Technol*, 1948, *23* 109–16, Herbert Mescon, Herman Beerman, and Fred D Weidman, "Adaption of the Adamstone-Taylor frozen section technic for rapid diagnosis of skin lesions," *J Invest Dermatol*, 1951, *16* 429–35, Edgar B Taft, "An evaluation of the Adamstone-Taylor frozen section technic for use in routine surgical pathology," *Amer J Path*, 1949, *25* 824

[74] William E. B Hall, "Advances in rapid tissue section methods an evaluation of more recently developed techniques," *Amer J Surg*, 1938, *41* 458–61, George T Mowat, "Rapid histology in diagnosis," *Trans Royal Med-Chir Soc. Glasgow*, 1930, *31*· 120–22, Escalona Zapata, "Biopsia intraoperatoria," pp 229–37

[75] Benjamin T Terry, "Increasing the pathologist's usefulness and his rewards with directions for preparation and use of a polychrome methylene blue stain for frozen sections," *JAMA*, 1920, *74* 1775–77, *idem*, "The rapid preparation of polychrome methylene blue stains for frozen sections of fresh and fixed tissue," *J Lab Clin Med*, 1922, *8* 157–64, William C MacCarty discussion of Benjamin T Terry, "A new principle in the microscopic examination of fresh unfixed tissue," *Proc Staff Meeting Mayo Clinic*, 1926, *1* 209–11, Benjamin T Terry, "A new and rapid method of examining tissue microscopically for malignancy," *J Lab Clin Med*, 1927, *13* 550–65

The razor section technique offered numerous advantages. First, it was easy to learn and required little manual dexterity. Second, it was extremely rapid. Many razor sections could be produced in the same period of time it would take to produce one frozen section, permitting greater diagnostic certainty. Third, it was easier to correlate gross and histological morphology because the greater thickness of the razor sections did not necessitate total destruction of the gross lesion. Fourth, it was possible to submit the same razor section specimen for later paraffin sections to confirm the rapid diagnosis. Fifth, the method was very inexpensive and easily transportable because it required only a razor blade, stain, glass slides with coverslips, and a microscope. It was ideal for the peripatetic pathologist.

The disadvantages of the technique were essentially the same as those of Wilson’s fresh frozen section. The stain faded in minutes, and the sections, because they were not fixed, were not permanent. In addition, the technique did not work on darkly pigmented or extremely vascular tissues because they were opaque.[79]

Terry used his informal connection with the Mayo Clinic to obtain institutional endorsement of his work. On 14 June 1926, he left his wife and family in Nashville and moved to Rochester, Minnesota. For the next two years, he worked in the Division of Surgical Pathology, apparently without pay, and tested his technique against the immense supply of surgical material available at the Mayo Clinic.[80] He concluded that his rapid diagnosis was correct 98 percent of the time.[81]

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[76] Benjamin T Terry, “Polychrome methylene blue used to help locate malignancy in tissues to be examined microscopically,” *JAMA*, 1923, *80* 1774, *idem*, “Rapid provisional microscopic diagnoses of malignancy without a microtome,” *JAMA*, 1924, *83* 1127–29, esp p 1127

[77] Terry, “Rapid provisional diagnoses,” pp 1127–29, *idem*, “Eine verbesserte, schnelle und leichte Methode, fixierte Gewebe für mikroskopische Untersuchungen mit reflektiertem oder durchfallendem Lichte zu praparieren,” *Munch Med Wochnschr*, 1924, *71* 1612–13, *idem*, “Provisorische mikroskopische Diagnose in Weniger als 60 Sekunden ohne Mikrotom,” *Med Klin*, 1924, *34* 1179–81, *idem*, “New and rapid method of examining tissue,” pp 550–65, *idem*, “Tissue prepared quickly for microscopic examination by staining razor sections with hematoxylin,” *J Techn Method*, 1929, *12* 1267

[78] C Alexander Hellwig, “Rapid tissue diagnosis comparison of microscopic diagnoses obtained from Terry’s razor sections and from paraffin sections in 4,326 biopsies,” *Arch Surg*, 1941, *42* 788–94 The quote is on p 789

[79] Terry, “New and rapid method of examining tissue,” pp 550–65

Terry adopted the promotional strategies of Wilson, MacCarty, Broders, and Bloodgood to publicize his work. From his hotel room at the Damon in Rochester, he corresponded extensively with pathologists who might be interested in his technique and with officials of professional organizations such as the American Medical Association and the American Society of Clinical Pathologists concerning the demonstration of his technique at their annual meetings. He attended numerous professional society meetings where he described his razor section technique during the discussion period following related presentations. Terry was always publicly supportive of Wilson's fresh frozen section technique, and the surgical pathologists of the Mayo Clinic were correspondingly publicly supportive of his method.[82]

Terry corresponded frequently and in friendly terms with Bloodgood concerning his progress in testing his technique at the Mayo Clinic and also concerning the possibility of demonstrating the razor section method "to you and your technicians on your own material and in competition with the methods you are now using."[83] Bloodgood's responses, though polite, were somewhat less cordial. Although he was unable to persuade Bloodgood, Terry had better luck with C. Alexander Hellwig, another influential proponent of the need for rapid diagnostic techniques during operations. Hellwig first observed Terry's technique in 1929, and after testing it thoroughly he substituted it for the frozen section method he had been using.[84] No record of Terry's overseas correspondence is available, but the Terry technique developed a following in Europe. The most prestigious advocate in Europe was Erwin Christeller of the Rudolf Virchow Krankenhaus in Berlin, who tested the reliability of the method and suggested that it opened a new era in the field of biopsy.[85]

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[80] Terry is not listed in *Physicians of the Mayo Clinic and the Mayo Foundation.* Furthermore, the Mayo Foundation Historical Unit was unable to verify his employment at the Mayo Clinic

[81] Benjamin T Terry, "Improvement in technic and results made in examining microscopically by the razor section method 2000 malignant tissues," *J Lab Clin Med*, 1928, *14* 519–31

[82] Terry, "New and rapid method of examining tissue," pp 550–65, esp p 563, see also discussion by William C MacCarty, p 564, Terry, "New principle in the microscopic examination of fresh unfixed tissue," pp 209–11, see also discussion, pp 210–11, Harold D Caylor, "A new method of examining fresh tissue," *J Lab Clin Med*, 1927, *12* 1035

[83] Benjamin T Terry to Joseph C Bloodgood, 9 March 1927, 12 March 1927, 20 March 1927, 3 January 1928 Quote from 12 March 1927 Bloodgood to Terry, 15 March 1927, Bloodgood Papers

[84] Christian Alexander Hellwig was born in 1889 in Meissen, Germany, and received his M D in 1916 at Bonn His post-graduate training was at Freiburg, Frankfurt-am-Main, and Augustana Hospital in Chicago From 1924 to 1949, he was the Director of Laboratories and Pathology at St Francis Hospital in Wichita, Kansas Hellwig wrote several influential articles on biopsy and rapid diagnostic techniques Joe J Lin, director of laboratories, St. Francis Regional Medical Center, personal communication, 6 March 1984 Hellwig, "Tissue diagnosis during operation Terry's technique," pp 494–98, Hellwig, "Rapid tissue diagnosis comparison of Terry's razor sections and paraffin sections," pp 788–94

[85] Erwin Christeller, "Erfahrungen mit der verbesserten histologisch-diagnostischen Schnellmethode nach Terry," *Klin Wochenschr*, 1928, *7* 448–50, Jean Sabrazes and Emile Magrou, "Diagnostic histologique quasi

In 1938 in a review of new techniques of rapid tissue diagnosis, William E. B. Hall of St. Louis stated that Terry's razor section method was superior to the others.[86] An essentially identical technique was described in the *New England Journal of Medicine* in 1944 by H. Edward MacMahon, a pathologist at Cambridge Hospital in Massachusetts, and his technician Shirley B DelVecho. This method was introduced because of a shortage of carbon dioxide cylinders during World War II and was used very effectively by MacMahon at Tufts Medical School and the New England Medical Center until the late 1960s. The technique was still employed at least occasionally in the 1980s by some hospitals in New England and in eastern Canada.[87]

Terry's technique was apparently well received wherever it was tried. According to Terry, "The razor section method has now been tested by many physicians. When they have carried out the technique under my supervision and on favorable tissues, no one has failed. Most doctors make good sections at the first or second attempt"[88] It is unclear why this simple and reliable technique was displaced by the more costly and technically more difficult frozen section. One practical explanation for the demise of the method is that utilization of the technique did not result in a permanent slide for documentation of the diagnosis.[89]

Another competing method of the post-World War I period, Ultropak illumination, enjoyed a moderate popularity in Europe. The Leitz Ultropak Illuminator was an instrument that permitted microscopic examination of the surface of opaque objects. The cut surface of gross biopsy specimens could be stained and examined without further processing. The method offered several advantages. First, it was very rapid because no sections had to be cut. Second, it did not destroy the specimen, as did some other techniques. Therefore, the intact specimen could be submitted later to be processed for paraffin sections to confirm the rapid diagnosis. Third, it allowed

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instantané par transillumination de segments, de tissus ou d'organes d'un millimètre environ d'épaisseur badigeonnés, sur la face regardant l'objectif, de bleu de toluidine phénique à 1%," *Ann Anat Path*, 1928, *5* 963–70 Henrique Parreira, "O método rápido de Benjamin Terry para exames microscópicos," *Lisboa Medica*, 1928, *5* 345–46, Carlo A. Lang, "Le biopsie e gli accertamenti diagnostici rapidi contributo al loro trattamento con metodo Terry," *Sperimentale*, 1929, *83* 63–82, Escalona Zapata, "Biopsia intraoperatoria," pp 229–37

[86] Hall, "Advances in rapid tissue section methods," pp 458–61

[87] H Edward MacMahon and Shirley B DelVecho, "A simple technic for rapid sectioning," *New Eng J Med*, 1944, *231* 794, James S Campbell, "An evaluation of a simple rapid-section technic for immediate histologic diagnosis," *New Eng J Med*, 1952, *247* 611–12 H Edward MacMahon, formerly chairman of pathology at Tufts-New England Medical Center, personal communication, 18 March 1984, and James S Campbell, Sir Frederick G Banting Research Centre, Health and Welfare, Canada, and formerly resident at Tufts-New England Medical Center, personal communication, 28 March 1984 and 29 April 1984

[88] Terry, "Improvement in technic and results," p 530

[89] According to George F Gray, professor of pathology at Vanderbilt University, (personal communication, 5 March 1984) no one within his department has any personal recollection of either Terry or his method Departmental records are sketchy prior to 1925 and little is known about Terry He left Vanderbilt in 1925 and did not return after he left the Mayo Clinic ca 1928 Gray doubts that Terry's method was used at Vanderbilt for long after Terry left and is certain that it was not used after the mid-1950s Terry was apparently in private practice in Rochester, Minnesota, after leaving Mayo In the early 1930s, Terry moved to Tacoma, Washington, and practiced pathology at Tacoma General Hospital

the pathologist to examine any surface or multiple cut surfaces of the specimen in order to determine more precisely the extent of a malignancy. Although utilized at several major American hospitals by European-born pathologists such as Emmerich von Haam of Tulane University, the technique never became popular in the United States.[90]

Yet another technique for rapid diagnosis during operations was the "wet-film method" introduced in the 1920s by Leonard S. Dudgeon, professor of pathology at the University of London, and C. Vincent Patrick, a surgical resident at St Thomas's Hospital in London. The method was actually a slight modification of a method of preparing wet-fixed films of protozoa. Dudgeon and Patrick scraped the cut surface of the biopsy specimen, made cytologic smears on glass slides, fixed the slides immediately in Schaudinn's fluid ("while still wet"), and stained them with hematoxylin and eosin. Experienced cytologists could make accurate diagnoses in less than ten minutes Although the new method was introduced as a general alternative to Ernest H. Shaw's frozen section technique, it appears to have been most popular among gynecologists Dudgeon's wet film method was a major advance in the field of cytology, but there is little evidence that the technique was used for rapid biopsy diagnosis outside of Great Britain.[91]

In 1929, Reinhold Dengler of the Allgemeinen Offentlichen Krankenhaus at Warnsdorf, Germany, described a technique using teasing, a very early method of tissue preparation that, like freezing, had been largely replaced by fixing, embedding, sectioning, and staining. The production of a teased preparation involved shredding a small tissue specimen as finely as possible with two small needles, placing the tissue on a glass slide in a drop of 1 percent acetic acid, putting a coverslip over the specimen, and examining it under the microscope. Dilute acetic acid was used to accentuate cellular detail and to increase the transparency of the connective tissue. This method, like that of Dudgeon and Patrick, utilized cytology rather than histology. It too was never widely used for rapid diagnosis in operations.[92]

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[90] Mowat, "Rapid histology in diagnosis," pp 120–22, Roger Leroux, "Technique nouvelle pour examens histologiques rapides," *Bull Assoc Franç Étude Cancer,* 1931, *20* 698–702, Roger Leroux, "L'examen histologique extemporane, technique de l'ultropak," *ibid,* 1938, *27* 673–78, Georges Gander, "Histoire et cytodiagnostic des tumeurs malignes," *Arquivo Patol* (Lisbon), 1949, *21* 439–61, Emmerich von Haam, "The importance of biopsy in the diagnosis of cancer" *New Orleans Med Surg J,* 1934, *87* 153–58, John J Clemmer, "Tumor clinic and pathologist," *Amer J Surg,* 1936, *32* 401–4, esp p 402, Escalona Zapata, "Biopsia intraoperatoria," pp 229–37

[91] Leonard S Dudgeon and C Vincent Patrick, "A new method for the rapid microscopical diagnosis of tumors with an account of 200 cases so examined," *Brit J Surg,* 1927, *15* 250–61, *idem,* "A new method for the rapid microscopical diagnosis of tumors," *Internat Clin,* 1928, *1* 220–23, Leonard S Dudgeon and Norman R. Barrett, "The examination of fresh tissues by the wet-film method," *Brit J Surg,* 1934, *22* 4–22, Arthur J Wrigley, "A method of rapid diagnosis of pathological specimens," *J Obstet Gynaec Brit Empire,* 1932, *39* 527–38, Joseph Bamforth and Gladstone R. Osborn, "Diagnosis from cells," *J Clin Path,* 1958, *11* 473–82, Bernard Naylor, "The history of exfoliative cancer cytology," *Univ Michigan Med Bull,* 1960, *26* 289–96, Joseph Bamforth, "Pioneer work by Professor Dudgeon in cytological diagnosis," *J Clin. Path,* 1963, *16* 395–98

[92] Reinhold Dengler, "Zur histologischen Schnellerkennung bosartiger Geschwulste," *Zentralbl Gynak,* 1929, *53* 457–59

The distrust of rapid frozen sections by several senior pathologists, primarily James Ewing of Memorial Hospital in New York and Aldred Warthin of the University of Michigan, led to much being done to develop rapid paraffin methods. Numerous paraffin techniques requiring fewer than twenty-four hours to complete, and some as little as one hour, were reported in the literature. Although none of these methods were really fast enough for diagnosis during operations, preparation of routine sections no longer required days or weeks Paraffin section diagnosis within two days became standard. Many pathologists, particularly those who already opposed rapid diagnostic techniques, felt that the development of rapid paraffin methods reduced the need for frozen sections.[93]

The proliferation of techniques suggests the importance that surgeons placed on biopsies with immediate tissue diagnosis. Surgeons believed that biopsy represented the most certain form of diagnosis because tissue diagnosis was "anatomical" proof of the clinical diagnosis. Immediate diagnosis during an operation was perceived as the epitome of "scientific" surgery because the pathologist not only confirmed the diagnosis but could actually guide the surgeon's knife. The inferiority of frozen sections to paraffin sections for diagnosis led to the introduction of other techniques for immediate diagnosis, but all of these had drawbacks as well. Both the Terry razor section method and Ultropak illumination permitted rapid histologic diagnosis, but the preparations were not permanent. Wet films and teased preparations offered superior cytologic detail but did not allow the pathologist to evaluate the behavior of the cells as was possible with histological techniques. Rapid paraffin sections, although an improvement over older techniques, did not permit immediate diagnosis. None of the other techniques proved to be altogether superior to frozen sections. Furthermore, none, with the possible exception of the Terry method, was promoted as vigorously as the frozen section had been by Bloodgood and the staff of the Mayo Clinic.

Early Biopsy Biopsy, which came to center so much on frozen sections, is not entirely a twentieth-century concept. An understanding of its history since the introduction of the frozen section in 1895 depends in part upon an understanding of earlier developments. In fact, as early as the 1840s, a handful of clinicians and pathologists recognized the potential diagnostic value of microscopic examination of surgically removed lesions.[94]

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[93] Aldred S Warthin, "Forty years as a clinical pathologist," *J Lab Clin Med*, 1931, *16* 743–50, Ruth C Wanstrom, "Rapid methods for preparing paraffin sections of tissues," *Amer J Clin Path*, 1937, 7 78–84, Simpson, "Frozen section fetish," pp 96–102, E G Lane, "Rapid and routine preparation of tissue sections," *J Lab Clin Med*, 1927, *13* 1143–45 As a practical matter, the indications for frozen section diagnosis became fewer with the advent of the rapid paraffin methods However, surgeons have been slower to recognize this than pathologists, presently, many pathologists believe that the frozen section consultation is requested excessively by surgeons See George W Kindschi, "Frozen sections their use and abuse," *JAMA*, 1984, *251* 2559–60, Louis P Dehner and Juan Rosai, "Frozen section examination in surgical pathology a retrospective study of one year's experience, comprising 778 cases," *Minn. Med*, 1977, *60* 83–94, esp pp 91–93, Lauren V Ackerman and Gustavo A. Ramirez, "The indications for and limitations of frozen section diagnoses a review of 1269 consecutive frozen section diagnoses," *Brit J Surg*, 1959, *46* 336–50, esp p 336

Carl Ruge, a gynecologist at the Women's Hospital in Berlin, was the first to use the procedure of "Stuckchendiagnose," as he termed it, routinely. In 1879, Ruge reported the results of a study in which the clinical diagnosis of cancer could not be confirmed by histologic diagnosis in over half of the uterine cervices removed by a prominent gynecologist. Therefore, he suggested that the microscopic examination of biopsy material should be used to confirm the clinical diagnosis of cervical cancer. In 1881 Ruge reported that the diagnosis of uterine cancer could be made from curetted specimens. Prominent German pathologists ridiculed this idea, arguing that cancer could be diagnosed only by observing invasion of deeper structures and metastases at autopsy, not by examining curettings of epithelium from living patients. In 1888, for example, the eminent pathologist, Rudolf Virchow, who had misdiagnosed as benign a malignant biopsy specimen from the vocal cord of the German Emperor Frederick III one year previously, expressed his reservations concerning biopsy and echoed the belief that cancer was best studied through autopsy materials. Ruge responded that clinicians should bypass the pathology professors and do their own microscopic diagnosis of biopsy materials.[95]

Biopsies were also performed occasionally by dermatologists in the late nineteenth century. In fact, the term "biopsy" was actually coined by a French dermatologist, Ernest Besnier, shortly before the turn of the century. In Besnier's textbook, *La Pratique Dermatologique,* published in 1900, "biopsie" is defined as "une sorte d' 'autopsie' sur le vivant."[96]

In spite of the work of Ruge and Besnier, the use of biopsies, prior to the introduction of rapid histologic techniques between 1895 and 1905 was very rare. Occasional articles from the late nineteenth-century surgical literature recognized the importance of confirming the clinical diagnosis with histologic examination of the removed tissues, but this was not considered as different from examining tissue at autopsy. The goal in both cases was to confirm the diagnosis, not to assist in its formulation. Credit for the growing belief that histology might guide surgery has to be given to those who developed the techniques for rapid diagnosis during operations. J. Escalona Zapata of Madrid in 1969 credited the "dynamism of the Anglo-Saxon mentality" for the introduction of biopsy and stated further that American pathologists had found practical applications for pathology while Central

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[94] Arthur B McGraw and Frank W Hartman, "Present status of the biopsy," *JAMA*, 1933, *101* 1205–9, J Marshall Neely, "The value of biopsy," *J Lab Clin Med*, 1936, *21* 1124–30

[95] Robert Meyer, "Carl Ruge," *Zentralbl Gynak*, 1926, *50* 1618, Volker Becker, "Carl Ruge, 100 Jahre Stuckchen-Diagnose," *Arch Gynecol*, 1979, *227* 193–204, Hellwig, "Biopsy in tumors," pp 609–610, Erwin H Ackerknecht, *Rudolf Virchow Doctor, Statesman, Anthropologist* (Madison University of Wisconsin Press, 1953), p 29

[96] Arthur I Spriggs, "An old neologism," *Lancet*, 1958, *2* 851

European academicians had rigidly studied autopsies.[97] Escalona Zapata was simply recognizing the obvious fact that although the process of biopsy had its roots in Europe, it became a largely American technique.

Early twentieth-century American physicians and surgeons were quick to adopt these new techniques because they were perceived to be "scientific." Claims to use scientific methods were a distinguishing characteristic of the allopath at the turn of the century, setting him apart from the irregular physicians, homeopaths, and quacks. By the second decade of the twentieth century, the idea of biopsy had a wide appeal, but few hospitals were capable of producing immediate frozen sections and even fewer pathologists were willing or able to make immediate diagnoses from them. Therefore, American physicians and surgeons performed biopsies without the aid of immediate frozen section diagnosis Routine histologic preparations required days or weeks, thus raising a question about the safety of biopsy as a procedure. Many believed that cutting into a tumor to remove a diagnostic specimen, closing the incision, and upon diagnosis of malignancy, reopening to perform radical surgery, promoted metastases and diminished the patient's chance of a cure. By contrast, few held the belief that the use of frozen sections promoted metastases. When a malignancy was found by this technique, a curative operation could be performed while the patient was still under the same anesthesia. The fear of promoting metastasis served as an impetus to the application of frozen section diagnosis.[98]

Specialization During the Early Twentieth Century and the Emergence of the "Clinical" Pathologist As the foregoing account has shown, numerous frozen section techniques were available by 1905, but the technique was not widely used until the 1920s and 1930s. Surgeons had quickly recognized the potential diagnostic value of information acquired through biopsy, but early twentieth-century pathologists were unenthusiastic about frozen section diagnosis or biopsies in general.

In the nineteenth century, pathology was not a clinical subject. Pathologists were academicians who taught courses on the theory of disease and performed autopsies for the advancement of science The goal of pathology research was to describe and understand disease; clinically related research was not generally of great interest to the pathologist This attitude, adopted from the German tradition under which the late nineteenth-century pathologists of the world had trained, is illustrated by the ridicule Ruge attracted in the 1880s by requesting German pathologists to study biopsy materials

In nineteenth-century America, the few laboratory tests used by clinicians were generally done by clinicians. In the early twentieth century, a dramatic increase in the number of laboratory tests occurring at the same time as the development and multiplication of community hospitals created a new niche for a specialist, the "clinical" pathologist.[99] Frozen section diagnosis was soon available in many prominent institutions and university hospitals, because pathologists and facilities were already available Routine use in community hospitals necessitated the establishment of a new specialist rather than teaching and research responsibilities

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[97] Escalona Zapata, "Biopsia intraoperatoria," esp p 231

[98] James R. Wright, Jr , "The Origin and Development of the Rapid Frozen Section Technique" (M.A. thesis, Ohio State University, 1984), the danger of a second anesthesia was also a major impetus for the use of frozen section diagnosis General sources on the history of the concept of metastasis are· Robert J Wilder, "The historical development of the concept of metastases," *J Mt Sinai Hosp*, 1956, *23* 728–34, Wilson I B Onuigbo, "A history of the cell theory of cancer metastasis," *Gesnerus*, 1963, *20* 90–95

The early decades of the twentieth century were characterized by increasing medical specialization in America and low incomes for physicians because of the oversupply of medical practitioners.[100] The better trained physicians protected their interests by banding together and establishing specialty organizations and later, specialty boards. Membership in a specialty group was granted after a certain level of competence was demonstrated. Specialists believed that consumers of medical or surgical services would naturally choose members of these elite guilds instead of other physicians so that the interests of both the specialists and the patients would be furthered.[101]

In 1921, clinical pathology was a specialty offering a relatively low income and low status, and there were only 450 clinical pathologists registered with the American Medical Association. Much of the clinician's ever increasing laboratory workload was being sent either to large commercial laboratories, which advertised low prices in medical journals, or to state public health laboratories, which often charged nothing at all, rather than to hospital laboratories under the clinical pathologist's supervision. In addition to the financial issue, clinical pathologists were treated as technicians rather than as peers and consultants by the rest of the medical profession. These issues prompted the formation, in 1922, of the American Society of Clinical Pathologists.[102]

[99] Aaron G Signy, "Trends in clinical pathologists," *J Clin Path*, 1970, *23*· 744–50, Warthin, "Forty years as a clinical pathologist," pp 743–50, Arthur H Sanford, "The development of clinical pathology as a specialty," *Minnesota Med*, 1943, *26* 52–57 References dealing with economic factors related to the origin of clinical pathology are William D White, *Public Health and Private Gain The Economics of Licensing Clinical Laboratory Personnel* (Chicago Maaroufa Press, 1979) and William G Rothstein, "Pathology the evolution of a specialty in American medicine," *Medical Care*, 1979, *17* 975–88 A recent article on clinical pathology in Philadelphia is Edward T Morman, "Clinical pathology in America, 1865–1915· Philadelphia as a test case," *Bull Hist Med*, 1984, *58* 198–214

[100] Lester S King, *American Medicine Comes of Age, 1840–1920 Essays to Commemorate the Founding of the Journal of the American Medical Association, July 14, 1883* (Chicago American Medical Association, 1984), pp 96–107

[101] James G Burrow, *Organized Medicine in the Progressive Era The Move Toward Monopoly* (Baltimore. The Johns Hopkins University Press, 1977), Rosemary Stevens, *American Medicine and the Public Interest* (New Haven Yale University Press, 1971)

[102] "On to Philadelphia' History of the American Society of Clinical Pathologists," *J Lab Clin Med*, 1925, *10* 678–90, Long, *History of American Pathology*, pp 199–202 It is interesting to note that similar economic and status problems for clinical pathologists were occurring simultaneously in Great Britain As a result, British pathologists formed the British Pathologists' Association in 1927 In 1930, the organization assumed its present name, the Association of Clinical Pathologists See William D Foster, *A Short History of Clinical Pathology* (Edinburgh E & S Livingston, 1961), pp 130–32 Pathologists in Central European countries were not affected by these factors because academic pathologists were subsidized by their hospitals

One of the Society's first actions was to attack the policies of the Advertising Committee of the American Medical Association for allowing unprofessional advertisements that quoted fees for laboratory services in the *Journal.* The Society also initiated an editorial and lecture campaign to promote the notion that physicians should "consult" the clinical pathologists they knew rather than use commercial laboratories, because the latter were often businesses managed by laymen for profits that did not have adequate methods of standardization of tests and whose test results were not interpreted by clinical pathologists.[103]

The plight of the clinical pathologist also concerned surgeons. In 1913, the American College of Surgeons had been formed as an honorary society for the surgical elite. The College's goal was to elevate both surgical practice and hospital standards. According to William D White, surgeons wanted to establish clinical pathologists and clinical laboratories in hospitals "to impose a minimum check on the quality of care being provided in hospitals" because "these checks ... provid[ed] a potential way to cut down on competition from nonspecialists, who presumably were practicing lower-quality surgery than specialists."[104]

In 1918, the College established a series of "minimum standards" for hospitals. Those hospitals meeting the criteria were "approved" by the College; all others were not. The 1918 standards pertaining to the practice of pathology required that hospitals provide "chemical, bacteriological, serological, and pathological services" and that these be "under competent medical supervision."[105] In 1926, the College's minimum standard was upgraded to specify "that the clinical laboratory shall be under the direction of a graduate in medicine, especially trained in clinical pathology."[106] The guidelines also stated, "All tissues removed at operations shall be examined in the laboratory and reports rendered thereon."[107] These revised guidelines were, in part, the result of lobbying by the American Society of Clinical Pathologists.[108]

Importance of Frozen Section Diagnosis to the Status of Clinical Pathologists

As has been noted, commercial laboratories were willing to perform laboratory tests inexpensively, but the American Society of Clinical Pathologists campaigned vigorously for giving its members the work, arguing that because the tests were clinically important, they should be performed and standardized by physicians with clinical training. The examination of surgical tissues became an important weapon in this campaign because it required considerable clinical experience and could not, therefore, be performed by nonphysician laboratory technicians.

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[103] Robert A. Kilduffe, "The choice of a pathologist," *J Lab Clin Med*, 1926, *11* 694–96, Bowman C Crowell, "The mutual relations existing between the clinic and the laboratory," *J Lab Clin Med*, 1925, *11* 37–43

[104] White, *Public Health and Private Gain,* p 55

[105] American College of Surgeons, *American College of Surgeons Thirteenth Year Book* (Chicago American College of Surgeons, 1926), pp. 33–44, esp p 36, William M German, *Doctors Anonymous The Story of Laboratory Medicine* (New York Duell, Sloan, & Pearce, 1941), pp 50–51

[106] American College of Surgeons, *American College of Surgeons Fourteenth Year Book* (Chicago American College of Surgeons, 1927), pp 43–74, esp pp 64–65, *idem, American College of Surgeons Fifteenth Year Book* (Chicago American College of Surgeons, 1928), p 30

[107] *ACS Fifteenth Year Book,* p 30

[108] White, *Public Health and Private Gain,* pp 50–56, focuses on the role of the American College of Surgeons in establishing pathologists and clinical laboratories in hospitals and ignores the role of the American Society of Clinical Pathologists

During its early years, Society members placed much emphasis on frozen section diagnosis because it required the immediate availability of clinical pathologists in hospitals. Unlike other laboratory tests which could be sent out to commercial laboratories, frozen sections had to be done in the hospital at the time of surgery

In addition to helping bolster their position in the community hospital, clinical pathologists viewed frozen section diagnosis as a way to increase their relatively meager incomes. Terry, speaking before the Section on Pathology and Physiology at the annual American Medical Association meeting in 1920, said, "It is hoped that many pathologists may be induced to try this method (frozen section), for increasing the pathologist's usefulness is one of the surest ways of increasing his rewards."[109]

Tissue pathology, though a small part of the daily activity of the pathologist, was glorified because it required the closest relationship with the clinician or surgeon and allowed the pathologist to demonstrate his clinical acumen. Dozens of papers and editorials concerning frozen section diagnosis were published by clinical pathologists in just a few years. Almost without exception, each stressed that fresh tissue diagnosis was consultation, that the clinical pathologist was not merely a histologist, but rather a physician with clinical expertise, and that it was important to include a summary of all relevant clinical information with the specimen. Some clinical pathologists even insisted upon gathering their own histories and doing their own physical examinations before patients were taken to surgery.[110]

Frozen section diagnosis in particular allowed pathologists to acquire a new sense of dignity as clinicians. During a heated discussion concerning the merits of the technique at the fifth annual convention of the American Society of Clinical Pathologists in 1926, one of the discussants, Herman Spitz of Baptist Hospital in Nashville, Tennessee, stated:

> It seems to me that we are missing the most important point in regard to frozen sections You will recall that during the first year of our existence as a Society, our president, Dr Hillkowitz, carried on quite a protracted discussion with the American Medical Association in regard to advertising As a result of that discussion, the Advertising Committee of the American Medical Association classified us as "manipulators of test tubes and other inanimate objects " Now it seems

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[109] Terry, "Increasing the pathologist's usefulness and his rewards," p 1777

[110] E Ellice McDonald and William C Hueper, "Cancer and the laboratory," *J Lab Clin Med*, 1931, *16* 713–33, Alvin B Foord, "The role of the pathologist in the cancer problem," *Amer J Clin Path*, 1934, *4* 321–26, Violet H Keiller, "Idle thoughts on tissue diagnosis," *Texas State J Med*, 1930, *26* 525–27

> to me that here is a splendid opportunity to refute that classification We are doctors, as much so as any other members of the American Medical Association. We are called into consultation by the surgeon when we are asked to do a frozen section The surgeon waits with bated breath until we give him our report. If we tell him to cut wide, he does so. If we tell him he has done enough and that no further surgery is required, he is satisfied. Now, if this is dealing with "test tubes and inanimate substances" somebody should rewrite the dictionary The method of doing a frozen section, the technic [*sic*] employed, the stains used, etc., are matters of personal preference. The real value in this paper is the fact that it tells the Advertising Committee of the American Medical Association that we are real doctors, dealing with life, just as all other physicians deal with life, and that we do something besides "manipulate test tubes and other inanimate substances."[111]

Clearly the fervor of this discussion grew out of the new importance of frozen section diagnosis for the clinical pathologist's status. Often the discussions of tangentially related topics became discussions of the frozen section technique.[112] For the clinical pathologist, doing frozen section diagnosis became a source of status, not only in the medical community, but also in the popular literature. The public was introduced to frozen section diagnosis through glorified and dramatic accounts of teamwork between surgeon and pathologist, who saved lives and spared patients from unnecessarily mutilating operations.[113] Ironically, at the time when surgeons and clinicians were striving to improve their practices by becoming more "scientific," pathologists, who had always been recognized as scientific, were striving for recognition as clinical diagnosticians.

Final Acceptance of the Validity of Frozen Section Diagnosis. No single date marks the final acceptance of the biopsy with rapid frozen section. As previously mentioned, there was never very much resistance from surgeons. Surgeons were more than willing to share the responsibility for operating room diagnosis with pathologists. In fact, the strongest support for routine frozen sections came from Bloodgood and other surgeons. Bloodgood, in one of his 1927 editorials, stated that the matter of hospitals without facilities for frozen section and diagnosis needed to be considered by the American College of Surgeons.[114]

On 17 October 1929, the Board of Regents of the College voted "to undertake the promotion of better cancer service throughout the continent and entrusted to the Committee on the Treatment of Malignant Diseases the task of perfecting the details by which this can be accomplished." Three of the fourteen members of the Committee, including its chairman, had been actively promoting frozen section diagnosis in the literature while none had actively opposed the method. It is, therefore, not surprising that the Committee's guidelines, published in 1930, stated that cancer clinics in general hospitals should have "a pathologist skilled in tumor pathology" and a "pathological laboratory service, including frozen section diagnosis convenient to the operating room." The Committee also stated that the early diagnosis of cancer is "extremely difficult and may be impossible without an exploratory operation . . . (and) diagnosis by means of a frozen section."[115] Although this Committee report did not have the clout of the Minimum Standards for Hospitals, it did set additional national standards towards which hospitals should work. Other groups of surgeons also followed with their own guidelines.[116]

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[111] Herman Spitz, discussion of Louis A. Turley, "The difficulties and value of frozen section methods," [appended to end of Turley's article] *J Lab Clin Med*, 1927, *12* 492–500 Quote is on p 499 Spitz was a member of the Executive Committee of the American Society of Clinical Pathologists and its representative to the American College of Surgeons See "Dr Spitz's address before the Clinical Congress of Surgeons," *J Lab Clin. Med*, 1925, *11* 207

[112] Discussion of Frederick H Lamb, "Symposium on surgical diagnosis Part III Laboratory procedures," *J Iowa State Med Soc.*, 1921, *11* 244–50, esp pp 248–49, discussion of Turley, "Difficulties and value of frozen section methods," pp 498–500, discussion of Louis A. Turley, "The value and character of reports and records of tissue examination," *J Lab Clin Med*, 1926, *11* 827–31, esp pp 830–31

[113] Jennie Q Adatto, "Cold facts," *Hygeia*, 1948, *26* 340–41, 374, German, *Doctors Anonymous*, pp 5–9

[114] Bloodgood, "Danger of incomplete removal of small and apparently innocent lesions," p 414

While surgeons were willing to share the responsibility of operating room diagnosis with pathologists, some prominent pathologists opposed rapid frozen section diagnosis. At the fifth annual convention of the American Society of Clinical Pathologists in 1926, Louis A. Turley noted that "at every meeting of this Society in the last several years, the question as to the value of frozen sections in tissue diagnosis has come up and the society has been pretty much divided into two camps, those in favor and those opposed to frozen sections."[117]

Many of the pathologists opposed to frozen section diagnosis believed that the technique was occasionally valuable but that surgeons abused their privilege by asking for frozen section diagnosis even when the diagnosis was apparent from the gross appearance of the lesion. Foremost among these skeptics was James Ewing of Memorial Hospital in New York. Others questioned the claimed superiority of the technique to gross diagnosis.[118] However, several statistical studies involving large numbers of patients strongly supported the superior accuracy of histological diagnosis of biopsy material.[119]

Some pathologists were offended by the circus-like atmosphere surrounding frozen section diagnosis. For instance, Warthin considered frozen section diagnosis a "fad" and Simpson considered it a "fetish." Simpson described the frozen section "consultation" in this way:

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[115] "Organization of service for the diagnosis and treatment of cancer," *Surg Gynecol Obstet*, 1930, *51* 570–74 The quotation is on pp 572–73

[116] See, for example, "Report of Breast Tumors Committee," *Calif West Med*, 1932, *37* 208–9

[117] Turley, "Difficulties and value of frozen section methods," p 492

[118] Simpson, "Frozen section fetish," pp 96–102, Miles J Breuer, "Frozen-section biopsy at operation," *Amer J Clin Path*, 1938, *8* 153–69, Michael G Wohl, discussion of Turley, "Difficulties and the value of frozen section methods," p 499, James Ewing, "The diagnosis of cancer," *JAMA*, 1925, *84* 1–4, esp pp 1–2

[119] William C MacCarty, "Absolutely necessary microscopic diagnosis," *Minnesota Med*, 1918, *1* 178–81, *idem*, "Efficiency in the diagnosis of neoplasms," *Surg Gynecol Obstet*, 1922, *35* 209–15, Walther Fischer, "Uber die Diagnose der Pathologen und Chirurgen," *Verhandl deutsch path Gesellsch*, 1927, *22* 182–85, Hellwig, "Biopsy in tumors," p 629, Elmer R. Jennings and James W Landers, "The use of frozen section in cancer diagnosis," *Surg Gynecol Obstet*, 1957, *104* 60–62

> The buzzer rings. The pathologist leaps to his feet, hastily excuses himself from his consultation with a member of the medical staff, and runs to the operating room. Seated on the amphitheater benches are a dozen visiting physicians to whom the surgeon has just described the hard fixed nodule in the breast of the woman who is asleep on the operating table. Greeting the panting pathologist with a patronizing smile, he turns to the audience "Here is our pathologist! He will have the diagnosis for us in three minutes!" Like a trained seal, the pathologist catches the small bit of tissue and rushes back to his laboratory. A few deft motions and the stained section is placed on the stage of the microscope. Realizing that the surgeon and his expectant audience await the diagnosis within three minutes, the pathologist hastily glances through the microscope and rushes back to the operating room "Scirrhous carcinoma!" he gasps, and withdraws as the surgeon undertakes the radical operation.[120]

Separation of Surgical Pathology from Clinical Pathology. As outlined, clinical pathology became a viable subspecialty during the 1920s and early 1930s.[121] Before 1926, many clinical pathologists were general pathologists doing laboratory diagnostic tests, autopsy pathology, and surgical pathology. Since specimens removed at surgery were thrown into the waste can unless the surgeon requested a histopathologic diagnosis, the burden of surgical pathologic diagnosis was not great and could be handled by the clinical pathologist in his spare time. Nevertheless, frozen section diagnosis was inconvenient, as was pointed out by Miles J. Breuer, a clinical pathologist from Lincoln, Nebraska:

> To any other consultation, the consultant is asked as to an appointment between peers and his convenience is considered. To one of the occasions, the pathologist is summoned arbitrarily through subordinates; his sensations are those of being subpoenaed. A general attitude prevails about the hospital that any surgical operation is an emergency and is entitled to ride rough-shod over every other consideration in the institution. Though considered less so than the clinician, the pathologist is nevertheless somewhat human To be unceremoniously called, in disregard of previous appointments and other important duties, will, in spite

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[120] Simpson, "Frozen section fetish," p 96

[121] Essentially, the American College of Surgeons' minimum standards established clinical pathology as a viable subspecialty and clinical pathologists as consultants In 1982, the clinical pathologist's status as a consultant again became precarious Following passage of enabling legislation by the Congress, the Health Care Financing Administration issued regulations setting maximum rates that will be paid by the federal government for certain medical services (Diagnosis Related Groups) These rate limitations affect primarily physicians not involved in direct patient care, such as clinical pathologists. Personal communication, Donald A. Senhauser, chairman of the department of pathology, Ohio State University, 31 January 1984, see also Jean Shaw, "Proposed regulations on reimbursement attacked," *Amer Med News*, 3 December 1982, 1, 10–11 Ironically, surgical pathology, an off-shoot of clinical pathology, is not as adversely affected by these regulations

> of his own conscientious efforts to be obliging and cooperative, prove distracting to his diagnostic reasoning.[122]

This matter of the inconvenience of frozen section diagnosis was partially responsible for the separation of surgical pathology and clinical pathology

The primary reason for the eventual separation of surgical pathology from clinical pathology was the 1926 modification of the American College of Surgeons' minimum standard. The upgraded standard required that all surgical specimens be examined by a pathologist and that a report be made upon each specimen. This standard essentially brought about the existence of a surgical pathology laboratory in every hospital whose authorities wanted College approval. After 1926, the burden of examining all tissue removed at surgery became so great in most hospitals that tissue diagnosis could no longer be done by the clinical pathologist in his spare time. Over the next decade, this development gave birth to a new specialty, surgical pathology. Examining surgical specimens became a full-time profession.

Surgical pathology and clinical pathology required different types of specialized knowledge and skills. The dissimilarity between tissue pathology and the remainder of clinical pathology was, therefore, a major factor in the eventual separation of clinical and surgical pathology. This separation was officially sanctioned in 1936 when the American Board of Pathology was established by the joint action of the American Society of Clinical Pathologists and the American Medical Association's Section on Pathology and Physiology. The American Board of Pathology approved three types of certification: 1) anatomical pathology, 2) clinical pathology, and 3) anatomical pathology and clinical pathology. Surgical pathology, because it involved the study of tissue, was included in the first category, anatomical pathology, and was distinguished from clinical pathology.[123]

In the late nineteenth century, the term "surgical pathology" referred to the surgeon's knowledge of gross pathology, and his ability to recognize lesions in situ with the naked eye. Authorities in the field were surgeons with an unusual interest in pathology (e.g., Sir James Paget and Theodor Billroth), not pathologists who worked with surgical specimens. Although well-trained surgeons realized that pathology was the foundation of surgery, the idea that a pathologist might guide the surgeon's knife did not appear until the early twentieth century.[124] John Stewart, in his address to the Canadian Medical Association in 1902, made the analogy, "What navigation was to seamanship, pathology is to surgery."[125] At this time, the navigator was still the surgeon, guided by his knowledge of pathology. Within a few years, navigation became, in part, the responsibility of the pathologist. In a symposium on cancer in New York in 1934, Steven Curtis, a pathologist, modified the analogy, "the relation of the pathologist to the cancer problem is somewhat like that of the navigator aboard ship. The navigator with his nautical instruments plots his course, thus assisting the pilot in guiding his ship."[126] This new allocation of responsibility (and credit) was, in part, the result of the expanding use of the rapid frozen section.

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[122] Breuer, "Frozen-section biopsy at operation," p 163

[123] Frederick H Lamb, "Certification of clinical pathologists," *Amer J Clin Path*, 1935, *5* 261–65, Foster M Johns, "Establishing certification and regulation of the practice of pathology," *Amer J Clin Path*, 1936, *6* 323–29, "The American Board of Pathology," *Amer J Clin Path*, 1936, *6* 514–15

[124] Henry T Butlin, "The Cavendish lecture on the application of pathology to surgery," *Brit Med J*, 1900, *1* 1577–82, also *Lancet*, 1900, *1* 1856–59, *St Louis Med Rev*, 1900, *63* 104, John Stewart, "The contribution of pathology to surgery," *Montreal Med J*, 1902, *31* 700–709, also *Canada Pract Rev* (Toronto), 1902, *27* 569–78, *Canada Lancet* (Toronto), 1902, *36* 86–94

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[125] Stewart, "Contribution of pathology to surgery," p 571

[126] Steven H Curtis, "The relation of the pathologist to the cancer problem" *NY State J Med*, 1934, *34* 598–99, esp p 598

THE DESCRIPTION AND DIAGNOSIS OF LEPROSY BY FOURTEENTH-CENTURY PHYSICIANS*

Luke Demaitre

Medieval leprosy, to be distinguished from the skin ailment called *lepra* in biblical and classical antiquity, seems to have emerged around A.D. 300 and to have spread over an area stretching from Syria and Alexandria to France and England. The disease apparently reached its peak in Christendom between the first crusade and 1300; and it generally disappeared from Europe, except from Scotland and Scandinavia, by the mid-sixteenth century.[1] A considerable corpus of historical studies has accumulated since the 1870s and 1880s when, coincidentally, the Norwegian doctor Armauer Hansen proposed that *Mycobacterium leprae* was the bacillus which caused the disease, and the Belgian missionary Damiaan De Veuster drew worldwide attention to the fate of lepers as outcasts.[2]

In the last decade, two richly documented studies in English have concentrated on the Middle Ages, namely Saul Brody's *The Disease of the Soul· Leprosy in Medieval Literature*[3] and Peter Richards's *The Medieval Leper and His Northern Heirs*[4] Compared with these two studies, the present essay is both more exploratory and narrower in focus. It explores, in a dimension between the literary archetypes emphasized by Brody and the real lives evoked by Richards, the endeavors of physicians to understand and to identify leprosy. My inquiry is focused on fourteenth-century authors because they were witnesses and possibly contributors to the turning of the tide. Their discussions are also more elaborate than the pre-1300 writings which have

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[1] A useful comprehensive introduction is Roland Chaussinand, *La Lèpre*, 2nd ed (Paris Expansion scientifique française, 1955) An excellent survey for England is the chapter on "The Problem of Leprosy" in Stanley Rubin, *Medieval English Medicine* (New York. Barnes and Noble, 1974), pp 150–71

[2] Important historiographies are Stanley G Browne, "Some aspects of the history of leprosy the leprosie of yesterday," *Proc. Roy Soc Med*, 1975, *68* 485–93, Philip A. Kalisch, "An overview of research on the history of leprosy," *Inter J Leprosy*, 1975, *43* 129–44, and Huldrych Koelbing et al, *Beitrage zur Geschichte der Lepra* (Zurich Juris Druck, 1972), especially the three articles on pp 55–100

[3] Ithaca. Cornell University Press, 1974

[4] Cambridge, Eng D S Brewer, 1977

Bull Hist Med., 1985, *59*· 327–344

been cited in virtually every previous study.[5] I have not only consulted major treatises but also examined a dozen shorter texts, most of which are available only in manuscript

One source that, though printed repeatedly from 1480 to 1697 and cited routinely by historians, still provides the best starting point, is the chapter on leprosy in Bernard de Gordon's *Lilium medicine.*[6] Intended as a "compendium of practice," the *Lilium* combines the full range of traditional doctrines with the author's personal comments, and it remained a major textbook for some three centuries. More important, it was written in 1303, on the threshold between the prevalence and the waning of leprosy. Above all, Bernard's chapter "*de lepra*" provides the *locus classicus* for the school of historians who cite medieval descriptions of leprosy as evidence that syphilis (or the closely related yaws) existed in Europe before Columbus would have returned "bearing gifts" from the New World.[7]

The belief that syphilis was endemic in Europe before 1493, however plausible, and though propounded by such luminaries as Charles Daremberg, Karl Sudhoff and Charles Singer, rests on premises that remain inconclusive[8] Paleopathology still depends on speculation about the antiquity, interactions, and pathogenic changes of various microorganisms which include not only the *Treponema pallidum* of syphilis but also the bacilli of leprosy and of tuberculosis.[9] The evidence from skeletons seems to remain controversial.[10] Until now, crucial arguments have hinged on textual interpretations that, as Nancy Siraisi observed recently, lay "more weight on the evidence than it can reasonably bear."[11] The latest instance of such creative interpretation and, in fact, the original stimulus for my present inquiry, occurs in a scholarly monograph by Claude Thomasset, published in 1982.

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[5] In order to avoid repeating much of the secondary literature, I shall refer only occasionally to such thirteenth-century authors as Bartholomaeus Anglicus, Gilbertus Anglicus, Theodoric of Cervia, and William of Saliceto

[6] References in this paper are to British Library MS Harl 3698, early fourteenth century Bernard is cited by Guy de Chauliac (see n 49 below), in the early fifteenth-century *Examen leprosorum* in Vatican Pal MS 1225, fol 17r, and in the fifteenth-century *Signa lepre* in Vatican Pal MS 1207, fol 18r The authoritative position of Bernard's chapter in Germany is documented, for the fourteenth century, by a German translation (Vienna MS lat [sic] 2864, fols 44v–56r), [Constantin] Hans Carlowitz, ed , *Der Lepraabschnitt aus Bernard von Gordons 'Lilium medicinae' in mittelalterlicher deutscher Uebersetzung* (Leipzig F Peter Nachf , 1913), and, for the fifteenth century, by the "Lepraschaubrief aus Frankfurt," ed Karl Sudhoff in *Lepra, Bibliotheca Internationalis,* 1911, *13 3* 159, according to a reference in Carlowitz, p 8, which I have not been able to track down

[7] Apparently the first to cite Bernard's chapter as evidence was Edmund Guntz, "Aussatz und Syphilis nach den Quellen des Bernardus Gordonius," *Archiv fur Dermatologie und Syphilis,* 1870, *2* 59–77 See also Karl Sudhoff, "Der Ursprung der Syphilis," *17th International Congress of Medicine, London 1913* (London Burroughs Wellcome, 1913), pp 25–36

[8] For historiographies of the debate, see J D Oriel and Aidan Cockburn, "Syphilis where did it come from?" *Paleopathological Newsletter,* 1974, *6* 9–12, and Francisco Guerra, "The dispute over syphilis—Europe versus America," *Clio Medica,* 1978, *13* 39–61 See also Jean Tisseuil, "La syphilis vénérienne n'est pas d'origine américaine," *Bull Soc franç path exot ,* 1974, *67* 40–44

[9] See William H McNeill, *Plagues and Peoples* (Garden City· Anchor/Doubleday, 1976), pp. 176–77 and references in corresponding n 55

[10] Skulls from a French leper cemetery proved pre-Columbian syphilis in Europe for Herbert Williams, "The origin and antiquity of syphilis the evidence of the bones," *Arch Path ,* 1932, *13* 779 and 931 On the other hand, skeletons clearly document lepromatous leprosy but prove "that syphilis did not exist in the Old World before Columbus" according to Vilhelm Møller-Christensen, "Evidence of Tuberculosis, Leprosy and Syphilis in Antiquity and the Middle Ages," in Robert Blaser and Heinrich Buess, eds , *Aktuelle Probleme aus der Geschichte der Medizin* (*Proceedings of the 19th International Congress of History of Medicine*) (Basel Karger, 1966), p 236 See also Egon Schmitz-Cliever, "Zur Osteoarchaologie der mittelalterlichen Lepra (II)," *Medizinhistorisches J ,* 1973, *8* 182–200

In his illuminating analysis of a thirteenth-century mirror of princes, titled *Le Dialogue de Placides et Timéo,* Thomasset comments at length on the story of the "Poison-Damsel," the maiden who kills by her embrace.[12] In this context Thomasset not only traces gynephobia and male morality to "the superstitious fear of menstruation, of contagion by leprosy, and of coition," but he also espouses the theory of a "*tréponématose endémique*" in medieval Europe. As his clinching evidence he invokes Bernard's *Lilium medicine* in which, he asserts, one only has to replace the word "leprosy" by "syphilis" to find "a good description of chronic syphilis."[13] Unfortunately, Thomasset conflates three different chapters of the *Lilium* on, respectively, satyriasis and priapismus, wounds and abscesses of the penis, and leprosy.[14] Moreover, his assertion is derived—by way of an intermediate source that is not always reliable[15]—from an article by Richmond C. Holcomb on "The antiquity of congenital syphilis."[16] Since Holcomb's article was presented in 1941 and it was inspired by the introduction of the Wasserman test in state marriage laws, it might be considered dated, yet it has so obviously become entrenched as a "canonical" reference that a revision seems overdue.[17]

Arguing that "the majority of the Latin texts between the years of 1050 and 1492" present leprosy as a contagious, venereal, and congenital disease, Holcomb concluded emphatically that what he saw there was "not modern leprosy, but a circumstantial description of congenital and venereally acquired modern syphilis."[18] His conclusion, however categorical, seemed indeed buttressed by the one text which he cited, a paragraph from the *Lilium medicine.* This paragraph, an excerpt from Bernard's etiology, should be quoted in full:

> Leprosy is either introduced from within the uterus, or after birth. If from within the uterus, it is because of conception at the time of menstruation, or

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[11] Nancy Siraisi, *Taddeo Alderotti and His Pupils Two Generations of Italian Medical Learning* (Princeton Princeton University Press, 1981), p 285

[12] Claude Thomasset, *Une Vision du monde à la fin du XIIIe siècle Commentaire du Dialogue de Placides et Timéo* (Geneva Librairie Droz, 1982), pp 73–108

[13] *Ibid*, p 88

[14] Thomasset erroneously refers to *Lilium* VII 2 ("De satyriasi et priapismo") while quoting from *Lilium* VII 5 ("De apostematibus et vulneribus virge"), and he repeats the unsubstantiated claim that Bernard associated the term "Persian fire" with his description, while suggesting that this description was part of Bernard's chapter on leprosy, *Lilium* I 21

[15] Namely Benjamin L Gordon, *Medieval and Renaissance Medicine* (London Peter Owen, 1959), pp 524–37

[16] Richmond C. Holcomb, "The antiquity of congenital syphilis," *Bull Hist Med* [cited by Thomasset as *Bull de l'Inst de l'Hist de la Méd*], 1941, *10* 148–67 Similar and contemporary was the treatment by James R. Whitwell, *Syphilis in Earlier Days* (London Lewis, 1940), pp 19–23

[17] Holcomb is cited not only by Benjamin Gordon and Claude Thomasset but also by Saul Brody, *The Disease of the Soul,* passim

[18] Holcomb, "Antiquity of congenital syphilis," pp 151 and 167

> because it is the child of a leper, or because a leper has had intercourse with a pregnant woman and thus the baby will be leprous, for leprosy is generated out of these great corruptions that befall the conception If it should happen after birth, this can be because the air is bad, corrupted and pestilential, or because of prolonged use of melancholic foods, such as lentils and other legumes, and from such melancholic meats as that of foxes, bears, wild boars, hares and other quadrupeds such as asses and the like, since in some regions all wild animals are eaten. Leprosy also arises from too much company with lepers, and from coitus with a leprous woman And also in him who lies with a woman who has lain with a leper whose seed still remains in her womb. For, from coitus with a leper the woman is not infected unless she continues a long time, because of the density of the womb But if a healthy man lies with a woman with whom a leper has lain, the leper's semen yet remaining in her womb, he will necessarily become leprous because the pores are loose in the male and the infection readily moves to the whole body. Therefore most extraordinary precaution is to be observed, and if some bad circumstance necessitates it, one should work to expel the seed from the womb by dancing, sneezing, bathing, and rinsing the womb with cleansing agents Furthermore, such measures should be taken as far in advance as possible, and there are many other means, which need not be recited, of expelling the received semen. Without these, one should be prepared for the gourd [i.e., the beggar's cup], [life under] the stars, and everlasting disgrace Everyone ought to guard against lying with a leprous woman, and I will tell what happened: a certain countess came leprous to Montpellier, and in the end she was under my treatment. A bachelor in medicine who attended to her, lay with her and impregnated her, and he was made completely leprous Fortunate therefore is he who is made cautious by the dangers of others [19]

This excerpt, taken by itself and in the light of modern findings, undeniably fits little of what we now call leprosy. We should note, however, that it also covers more than syphilis. The etiology is not exclusively venereal, for "bad air" and "melancholic foods" are included among the causes—as they are in virtually all parallel texts.[20] In fact, right after the passage excerpted by Holcomb, Bernard adds that

> also the eating of fish with milk in the same meal induces leprosy, as does the nauseant surfeit from warm foods which burn the blood or from cold and dry melancholic foods, as stated earlier Therefore, people who are very weakened by choler, who are very warm and adust having a warm liver, should be on their guard because they are in an intermediate stage. Even though the immediate cause [of leprosy] is melancholic matter and a bad dry complexion, and though in this respect there is only one kind, in view of the antecedent causes there are four kinds.[21]

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[19] Bernard de Gordon, *Lilium,* fol 13ra–b Except for some emendations to render the Latin more faithfully, the translation is that of Holcomb, "Antiquity of congenital syphilis," pp 151–52

[20] The common source of this etiology is Avicenna's *Canon* IV, fen 3, tract iii De lepra, cap 1 De causis I have consulted the incunabulum *Canon de medicina, Libri I–V,* trans Gerardus Cremonensis (Venice Petrus Maufer, 1486), at the New York Academy of Medicine

[21] *Lilium,* fol 13rb

Adopting the standard classification, Bernard then attributes each of the four kinds to the "adustion" or burning up of one of the humors: yellow bile or choler changes to black bile and causes *leonina,* burned blood causes *allopicia,* black bile or melancholy leads to *elephantia,* and phlegm is the basis of *tyria.*[22]

If Bernard's article on causes is taken in its entirety, if it is correlated with the "definition" or pathology which opens his discussion of leprosy, and especially if it is placed in the perspective of the complete chapter (which is more than twenty times as long as the paragraph quoted by Holcomb), it demonstrates some fundamental problems of interpretation.[23] Since medieval accounts of leprosy interweave traditional formulas with contemporary teaching and speculative explanation with personal observation, the degree of their correspondence with reality is often hard to determine. In so far as they are conceptually locked into the all-explaining scheme of the four humors and the four complexions (combinations of hot, cold, dry and moist), they will not be more accessible to modern scientific exegesis than, say, Taoist accounts based on Yin and Yang. Moreover, for want of specific etiology and of controlled observation, such accounts cast the widest possible net in "fishing" for likely causes, and they depended on effects that surfaced after long intervals. In fine, since the causes of leprosy were—and largely still are—so very elusive, etiology provides the least reliable road towards identifying the disease described centuries ago.

With these reservations in mind, we now return to the textual evidence and inquire to what extent leprosy was defined as congenital, contagious, and venereal. Bernard's account of various origins *in utero,* quoted above, is elaborated as a separate item in the explanatory section or *clarificatio* of his chapter He states that adust melancholy, "the matter of leprosy, is so greatly pernicious that it cannot be corrected in the womb and thus ... it generates a hereditary disease and infects what is next to it, as these verses say: acute fever, phthisis, epilepsy, scabies, erysipelas, anthrax, lupus, and leprosy are known as contagious."[24] One may be surprised not so much that Bernard considered the terms hereditary and congenital as synonymous, an equation that was then virtually inevitable, but that he confused contagious with hereditary diseases He was quoting the wrong verses from the Salernitan collection instead of the more appropriate line that "Morphea with leprosy, tinea [ringworm], phthisis and gout are inherited, as is the stone from old men."[25]

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[22] *Ibid* The derivation of these terms from animals (lion, fox, elephant and snake respectively) and the connections with the hues of the humors (yellowish, reddish, blackish and greenish *ibid*, fol 13va) suggest that these four conventional types of "leprosy" aimed at schematizing various skin disorders

[23] It may also be noted that Bernard's chapter is much more elaborate and complex than the comparable treatment, a generation earlier, by Theodoric of Cervia (Borgognoni, of Lucca), for which see Teodorico Borgognoni, *The Surgery of Theodoric,* trans Eldridge Campbell and James Colton, 2 vols (New York Appleton-Century-Crofts, 1955–60), 2· 167–79

[24] *Lilium,* fol 16ra For the context of this statement, see my *Doctor Bernard de Gordon, Professor and Practitioner* (Toronto Pontifical Institute of Medieval Studies, 1980), pp 107–8

Except for this momentary lapse, Bernard's belief in the heredity of leprosy was faithful to contemporary scholastic teaching. The common thesis held that "a leper begets a leper, even if it is not immediately apparent,"[26] and a standard question in the medical examination of a person suspected of leprosy was "whether his parents or relatives were lepers."[27] The most frequently cited source was Avicenna's doctrine that leprosy could be due to "heredity and to the complexion out of which the embryo is created ... or to the complexion acquired in the womb from its disposition, as in the case of conception during menstruation."[28] While Avicenna distinguished at least vaguely between "complexional" causes before and after conception, most authors evidently thought of prenatal infection when they assigned the cause to the womb. However, some came closer to true heredity when, like Albertus Magnus, they blamed "infected sperm" (male and female) for the assumed fact that "a leper begets a leper."[29]

It is important to note that, beyond the assumptions of a mere congenital transference of the disease itself, we may catch an occasional glimpse of more sophisticated hypotheses. Thus, Bernard de Gordon suggested that, even when the sperm is affected by leprosy, the ensuing corruption of the offspring's complexion might be reproduced in a milder form when it was mitigated by a good regimen, by the environment, or by a healthy womb.[30] An anonymous but contemporary *quaestio* on the same subject declared that "there are some who become more affected, some less, and others very little, so that children born from them appear leprous earlier or later although, simply speaking, they will become leprous in the end."[31] The most intriguing idea is that of an inherited susceptibility. In a commentary on Avicenna,

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[25] *Flos medicinae Scholae Salerni,* ed Salvatore de Renzi, in *Collectio salernitana,* 5 vols (Naples Filiatre-Sevezio, 1852–59), 5 71 The verses quoted by Bernard are also cited, but then in the correct relation to contagion, by the anonymous author of the *questio* "Utrum leprosus possit inficere sanum," in Erfurt Amplonianum MS F 288, thirteenth-fourteenth century, fols 84v–85r

[26] "Leprosus generat leprosum, sed quod cito non appareat quatuor sunt cause ," *Questiones,* in Erfurt Amplon MS F 288, fol 84vb

[27] "Cum morbus lepre est hereditarius simul et contagiosus, querendum est an ne parentes aut consanguinei eius consueverint esse leprosi," *Examen leprosorum,* in Vatican Palatine MS 1225, fol 17r "Interrogetur si habuerit parentes leprosos," *Signa lepre,* in Vatican Pal MS 1207, fol 18r "In primis debet interrogare de his que disponunt ad lepram ut si ipse est de genere leprosorum," *Iudicia leprosorum* (a text that includes part of the *iudicium* of Guy de Chauliac cited in n. 49 below), in Basel MS D II 13, fourteenth-fifteenth century, fol 29r

[28] ". quandoque propter hereditatem et propter complexionem embrionis ex qua creatus est aut acquisitam in matrice propter dispositionem que est ei sicut si accidat ei ut sit conceptio in dispositione menstruorum," *Canon* IV 3 iii.1

[29] "Occasionatus generat occasionatum et leprosus leprosum, quia ultimus cibus leprosi, cuius superfluitas est sperma, inficitur secundum infectionem totius corporis Unde sperma leprosi est infectum, et ideo consimilis est infectio in fetu," *Quaestiones super De animalibus* XV, q 13, ed. Ephrem Filthaut in *Alberti Magni Opera Omnia,* 40 vols (Munster Aschendorf, 1951–), 12 267 See also the notion of "sperma maculatum" in n 32 below

[30] "Possibile est quod leprosus sit boni regiminis et tempus temperatum et ita corrigitur lapsus complexionis, et quod [sperma leprosi] inveniat in matrice quod etiam rectificat," *Lilium,* fol 16ra.

[31] *Questiones,* in Erfurt Amplon MS F 288, fol 84vb

Master Albertus de Zanchariis (of Bologna) around 1320 observed that "leprosy sometimes occurs on account of heredity through the principle of generation, going from parents to children either directly or by disposition (*actu vel aptitudine*)."[32]

The definition of leprosy as contagious was similarly qualified by Albertus de Zanchariis when he stated that a condition for becoming infected was susceptibility: one's body had to be so "disposed."[33] In fact, medical writings express less concern with infection than might be expected, and only in three have I found a warning that the physician should "avoid the leper's breath" during examination or treatment.[34] Furthermore, if any medical doctrine of contagion reinforced popular fears and thus contributed to the notorious expulsion of lepers from society, this should not blind us to the apparently frequent infractions and relaxations of isolation.[35] Nor should we overlook the modifiers added by several physicians to the idea of contagion. Thus, the medical examiner was expected to ask whether a suspected patient had "kept company with lepers"[36] or, more precisely, "had been wont to keep their company (*consueverit conversari*)"[37]—it is rather misleading when this verb is translated simply as "to converse" or "to speak with." Yet another qualification occurs in an early fourteenth-century *quaestio* "whether a leper can infect a healthy person": there may be blatant error both of fact and of logic in the answer that "*we see* the healthy infected by lepers *because* the disease is contagious," but there is truth as well as error in the conclusion that "even if one is not disposed to leprosy, nevertheless on account of continuous presence among the infected one can become infected too, because the air and consequently the healthy person's blood is corrupted by lepers, and thus I say that one who is healthy can become leprous through continued living (*per continuam moram*) with lepers."[38]

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[32] Albertus de Zancharius, *Glose super tractatum Avicenne de cura lepre,* in Paris BN MS lat 7148, fol 27r, where also the view is propounded, on the authority of Haly Abbas, that "quoniam in patiente leproso humores sunt maculati, et quia sperma ex humoribus deciditur, sic ex eo egreditur sperma maculatum " Compare "a spotte or filynge of þe generacioun (i of þe gendrynge or getynge)," Guy de Chauliac, *The Cyrurgie of Guy de Chauliac,* ed Margaret S Ogden (Early English Text Society, series no 265, London Oxford University Press, 1971), p 378

[33] "Ut corpus illi proximum debite sit dispositum," *Glose,* fol 26v

[34] "Cavendo sibi semper de anhelitu examinandi ne medicus inficiatur," *Signa lepre,* in Vatican Pal MS 1207, fol 18r While treating, "caveant ergo medici ne ab infirmo suscipiant anhelitum," *De lepra,* in Basel MS D III 10, fol 11r And the physician "caveat sibi a contagiositate ne inficiatur confabulando cum eis vel operando vel medicinam administrando," Johannes Anglicus de Gaddesden, *Rosa anglica practica medicinae* (Pavia. Franciscus Girardengus, 1492), fol. 58rb (at the New York Academy of Medicine)

[35] While relaxations may have been exceptional and prompted by a patient's status, infractions were apparently common in French towns Thus, reiterating an ordinance issued by Charles V in 1371, Charles VI warned in 1413 that "plusieurs hommes et femmes mescaulx et infects de la maladie de lepre, de jour en jour sont tousjours allans et venans par lesdites villes, querans leurs vies et aumosnes, beuvans et mangeans parmy les rues, carrefours et autres lieux publiques où il passe le plus de gens, en telle manière qu'ils empeschent et destourbent bien souvent les gens à passer et aller en leur besongnes ," quoted in Edouard Jeanselme, "Comment l'Europe, au moyen âge, se protégea contre la lèpre," *Bull Soc franç hist méd ,* 1931, *25* 112

[36] "Si est conversatus cum eis [i.e , leprosis]," *Iudicia,* in Basel MS D II 13, fol 29rb

[37] *Signa lepre,* in Vatican Pal MS 1207, fol 18r, *Examen,* in Vat. Pal MS 1225, fol 17r Bernard de Gordon refers to "nimia confabulatione" or, in variant readings, "via et confabulatione cum leprosis," *Lilium,* fol 13ra

[38] *Questiones,* in Erfurt Amplon MS F 288, fol 85ra.

While the notions of susceptibility and continued exposure may soften the contrast between our own understanding and the medieval descriptions of leprosy as congenital and contagious, the venereal aspects remain irreconcilable with modern findings that the disease is not transmitted sexually.[39] Especially the characterization by Bernard de Gordon, quoted earlier, is too unequivocal and graphic to be dismissed as less than a suggestion that the label "leprosy" covered syphilis as well as real Hansen's disease. However, Bernard's venereal interpretation is by far the most precise, comprehensive, and elaborate I have found. The other medical texts examined for this essay are much terser and show a great diversity on this point. A standard item in the *quaestiones* literature was the doubt "whether a healthy man having sex with a leprous woman is infected sooner than vice versa," with an affirmative answer based on the premise that woman, though of a "weaker complexion," expels superfluities from the womb while man has large pores, veins and arteries which lead the "poisonous matter" or the "corrupted fumes" quickly from the penis to the vital organs.[40]

In the guides for examinations, "coitus with a leprous woman" was to be considered, although we should note that this was only one of some thirty to more than fifty queries.[41] More inclusive was the query whether the patient "had lain with a leprous man *or* woman."[42] A further category was added in one questionnaire, namely whether the suspected man "had lain with the woman of another leprous man."[43] The same questionnaire also asked "whether he had had frequent intercourse with a menstruating woman"[44] An anonymous treatise, *De lepra*, from the fifteenth century included the same potential cause and added the observation that "these days leprous children are especially generated in the conception by a menstruating woman, because at that time she enjoys sex more as her blood tingles and she is tickled; and thus, as the child is conceived in the flow of the menstrua, he will undoubtedly incur leprosy or scabies." This treatise, which in general offers one of the least sophisticated discussions, also states rather categorically, "if you have sex with lepers you will be leprous."[45] Such blunt generalizations, apparently more in tune with folklore than on the level of scholarly debate, are offset by the complete absence of venereal etiologies in several guides for medical examinations and in Albertus de Zanchariis's commentary on Avicenna.[46]

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[39] Two tangentially related observations, namely that pregnancy predisposes to leprosy and that the risk of syphilis is increased by leprosy, were made by Stephen Ell in a 1983 paper on "Two puzzling features of medieval leprosy descriptions," abstracted in the *Society for Ancient Medicine Newsletter*, 1983, *11* 15–16

[40] *Questiones*, in Erfurt Amplon MS F 288, fol 85ra, also, "queritur utrum sana coiens cum leproso citius inficiatur quam e converso," in Basel MS D I 11, fol 198rb Contagion by "fumes" is mentioned by Roger Bacon. "fumus ab eo [sc calore naturali] dissolutus necesse est ut assimiletur, sicut est fumus patientium lepram," *De conservatione iuventutis,* ed. Andrew G Little and Edward Withington in *Opera hactenus inedita Rogeri Baconi,* fasc 9 (Oxford Clarendon Press, 1928), p 140

[41] Thus, "coitus com leprosa" is among fifty-seven items (forty-six of these numbered) listed at the end of *Signa lepre* in Vatican Pal MS. 1207, fol 19v

[42] "Item si coivit cum leprosa vel leproso," *ibid*, fol. 18r

[43] "An ne concubuit cum muliere alterius viri leprosi," *Examen,* in Vatican Pal MS 1225, fol 17r

[44] "Aut frequenter cum muliere menstruata se commiscerit," *ibid*

[45] "Istis temporibus pueri leprosi maxime generantur in conceptione menstruantis quia tunc mulier tempore menstruorum plus delectatur in coitu quia sanguis eius mordicat et sic venit titillatio Et sic cum puer concipitur in fluxu menstruorum sine dubio incurrerit lepram vel scabiem Item lepra est universalis corruptio humorum et est morbus contagiosus Et si cois cum leprosis eris leprosus," *De lepra,* in Basel MS D III 10, fol 6v, and, "causa lepre est coitus cum leprosa vel cum menstruosa," *ibid*, fol 8r

It is particularly significant that no allusion to sex as a cause was made by Arnald de Villanova, Bernard de Gordon's senior colleague at Montpellier, in his treatise *On the Examination of Lepers*,[47] or by Jordanus de Turre, a successor of Bernard in the 1320s, in his *Notes on Leprosy*.[48] The same is true for Guy de Chauliac in his *Inventarium* or *Chirurgie* written in 1363, even though Guy treated the causes of leprosy in detail and commented that Bernard had "treated this matter full well."[49] It is ironic that Guy's omission sorely irked and disappointed Holcomb, who complained that everything Bernard had "told us of the venereal features was ignored and lost through the influence of one who occupied a dangerous position of authority, being physician to three Popes ... Guy de Chauliac [who] ignored the importance of *primitive* or external causes such as are the result of contact infection through venery." Unwittingly alerting the historian to the dangers inherent in wishing that the evidence speak for him instead of for itself, Holcomb concluded that Guy "disposed of the cogent descriptions of Bernard. Guy's work was immensely popular.... Having a large following, by ignoring the venereal causes, he completely obscured the progress made by his predecessors in an understanding of syphilis, and the etiology of the disease in a fog of disputation and theory, was shoved back to the time of Galen."[50]

Guy's etiology of leprosy is actually more succinct than Bernard's, and both authors anchor their explanation in Galenic humoral theory by stressing "burned melancholy" as the crucial cause[51] This etiology raises a further question. Adust melancholy was also traditionally blamed for insanity.[52] It is well known that insanity is a frequent concomitant of tertiary syphilis but not of any form or stage of leprosy. One wonders, then, why scholastic physicians, who always endeavored to make logical connections among multiple effects of a single cause and particularly of the same humor, never associated insanity with what they called "leprosy," if it really included syphilis.[53] My last query on the presumed confusion between leprosy and syphilis is equally speculative. It would seem that the incidence of both congenital and venereal syphilis, combined with verifiable leprosy, should result in higher total numbers of "lepers" than those now estimated from documentary evidence. The total for Europe in the thirteenth century has been set, perhaps conservatively, at 19,000 lepers.[54] The city of Bruges tallied seventeen confirmed cases in 1309.[55] Both of these figures, which admittedly do not constitute a very solid premise, would translate to ratios of three lepers per 10,000 persons, certainly far lower than one might guess on the basis of spontaneous images of the Middle Ages.[56]

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[46] Albertus's silence on sex as a cause is all the more remarkable because he does address the question of whether sex is good for lepers, as may be seen below (n 77)

[47] I have collated the printed *Signa leprosorum* in Arnald's *Opera* (Lyon, 1509), fol 214r with copies of *De examine leprosorum* in Munich Cod. lat 660, fols 46r–47r, in Vatican Pal MS 1210, fols 6v–7r, and in Oxford St. John MS 197, fols 284–290

[48] Magister Jordanus de Turre, *De lepra nota,* in Basel MS D I 11, fols 97v–99r

[49] Guy de Chauliac, *Cyrurgie,* ed Ogden, p 378

[50] Holcomb, "Antiquity of congenital syphilis," pp 161–62

[51] Guy de Chauliac, *Cyrurgie,* ed Ogden, pp 378–79 Bernard de Gordon, *Lilium,* fols 13r and 16r See also Margaret S Ogden, "Guy de Chauliac's theory of the humors," *J Hist Med*, 1969, *24* 272–91

[52] Thus, Bernard de Gordon, *Lilium,* fol 30r Suffice it to cite one of several studies on the medieval etiology of insanity, Heinrich Schipperges, "Melancholia als ein mittelalterlicher Sammelbegriff für Wahnvorstellungen," *Studia generalia,* 1967, *20* 723–36

[53] The physicians did not characterize as insanity the behavioral aberrations (*mali mores* and dreams) discussed below, even when they called them "melancholic"

The issue of leprosy as a "social disease" extends beyond its possible connection with syphilis, for the preoccupation of many historians with venereal etiology has a serious further consequence. It lures them into inferring that medieval physicians sanctioned the moral overtones which indisputably dominated the treatment of leprosy in the literary, devotional, and popular sources.[57] The author of a recent article, clearly concerned to underscore the contrast between the advanced views in Islam and the less humane attitudes in Christendom, not only claimed that "in the medieval western *medical* texts, leprosy was a readily contagious venereal disease linked with moral impurity," but he also insisted that "European doctors ... added unnecessary fear, loathing, and censorship to their accounts of the disease."[58] In view of such a sweeping indictment, the evidence merits re-examination.

In the second century A.D., Aretaeus of Cappadocia stated that leprosy or *elephantia* was also called *satyriasis* on account of "redness of the cheeks and the irresistible and shameless impulse to coitus."[59] While no medieval authors seem to have known the writings of Aretaeus, several indeed believed that lepers were abnormally libidinous. This belief is echoed in the guidelines for medieval examiners who were to inquire whether suspects were "vehemently inclined towards concupiscence"[60] or whether they "desired venery more than is usual, burned in coitus, and felt weaker than usual after intercourse."[61] Even though such beliefs contradict the finding of modern scientists that leprosy decreases hormonal stimuli, they may nevertheless have some factual basis in the psychological reactions of lepers to their desperate fate, stigmatization, and isolation.[62] It seems pertinent, in this respect, to point out that the query about a suspect's sex drive was not an item by itself but a part of the broader examination of his behavior, about which more will be said shortly. Furthermore, it should be emphasized that an abnormally increased libido is not included among the symptoms in the didactic treatises by physicians and surgeons, from Gilbertus Anglicus and Theodoric of Cervia to John of Gaddesden, in addition to those already cited in this paper.[63] Nor did Bernard de Gordon in this context allude to the term *satyriasis,* although this is a disease to which he devoted a separate chapter of the *Lilium medicine* (VII.2), and on the other hand he mangled the classic epithet *facies satyrica* by describing the leprous face with gaping nostrils as looking like "that animal which is called satyr."[64] The closest these authors came to hinting at the symptom of excessive venereal desire was when they prescribed the investigation of a suspect's "manners, dremes, and desires," in the words of Guy de Chauliac.[65]

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[54] McNeill, *Plagues and Peoples,* p 175 and n 50 Europe's population during the thirteenth century is conventionally estimated to have been between sixty and seventy million

[55] André Van den Bon, *Het achthonderd jaar oud Sint-Janshospitaal van de Stad Brugge* (Bruges Kommissie van Openbare Onderstand, 1974), p 81 Bruges at that time had at least 50,000 inhabitants See also Griet Maréchal, "Lepra-onderzoek in Vlaanderen (XIVde-XVIde eeuw)," *Annales de la Société belge de l'histoire des hôpitaux,* 1976, *14* 27–65, and *idem,* "De leprozen in de kwartieren Brugge en het Brugse Vrije, nieuwe cijfers," *Annales de la Société d'émulation de Bruges,* 1979, *116* 147–62

[56] The ubiquity of leprosy seems evoked, for example, in the statement that "the medieval practitioner saw it everywhere," in Brody, *Disease of the Soul,* p 24 Or see the suggested estimate that "about one person in 200 would have been a leper," cited in Charles Singer and E Ashworth Underwood, *A Short History of Medicine,* 2nd ed (New York. Oxford University Press, 1962), p 86

[57] Thus, Brody, *Disease of the Soul,* pp 51–59

[58] Michael Dols, "Leprosy in medieval Arabic medicine," *J Hist Med,* 1979, *34* 332 (emphasis mine) Some key phrases of Dols's assessment are borrowed rather verbatim (and without exact attribution) from Brody See also notes 75 and 81 below

[59] *The Extant Works of Aretaeus, the Cappadocian,* ed. and trans Francis Adams (London, 1856), p 368

[60] "Quintum [signum] est morum pravitas, violentia quia facile irascuntur nec statim mitigantur nec confidunt in aliquo, avari, tenaces, ad concupiscentiam vehementer inclinati, mali et dolosi," *Examen,* in Vatican Pal MS 1225, fol 17r

In general, the medical writings reiterated a diagnostic phrase that went back at least to Avicenna, stating that lepers would display "melancholic, bad and crafty habits (*mores melancholici, mali et dolosi*)."[66] The term *mores* in this context is quite free of the "moral" censure which a modern reader may be tempted to find in it,[67] and it does not reflect the preoccupation with sex which may flavor the usage in other sources or in later ages. Instead, the phrase *mali mores* clearly referred to behavioral concomitants of a bodily illness, and it was regularly explicated as irascibility, aggressiveness, distrust, and depression. Thus, lepers show "bad habits and violence for they are easily angered and not quickly calmed, and they do not trust anyone,"[68] or

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[61] "Tandem proquerantur eorum mores a notis eorum quia sunt ut plurimum mali morum, dolosi, suspiciosi habentes quemlibet suspectum de nocumentis; sunt astuti intentes se ingerere super populum, irascuntur et furiantur magis solito, appetunt etiam venerem magis solito et ardent in coytu et sentiunt se debiliores solito ex coytu," *Signa,* in Vatican Pal. MS 1207, fol. 19r. See also *Circa examen leprosorum,* in Vienna NB MS 5511, fol. 66v.

[62] Ironically, there may be "a hypersensitivity to sex hormones" during periods of remission, according to Ell, "Two puzzling features," p. 16.

[63] With the possible exception of Jordanus de Turre, to whose treatise *De lepra nota* is appended (perhaps by another author) a synopsis including "appetitus veneris magis solito," in Basel MS D.I.11, fol. 97vb.

[64] "Exterius dilatat [lepra] nares et ideo habet [leprosus] aspectum horribilem sicut illud animal quod appellatur saton (saron, satyron)," *Lilium,* fol. 15ra. Compare "þai semen comunely like satires. Satiris forsoþe or satoun is a beste of horrible (i. gasteful) lokynge in þe londe of Arabye," Guy de Chauliac, *Cyrurgie,* ed. Ogden, p. 380. These descriptions diverge strangely from their likely source, "et apparet supra corpus additio glandulosa similis animali quod grece nominatur sacos," Avicenna, *Canon* IV.3.1.

[65] Guy de Chauliac, *Cyrurgie,* ed. Ogden, p. 381. Similarly, "inquirat . . . de astutia et moribus ipsorum et somphiis et desideriis eorum," *Iudicia leprosorum,* in Basel MS D.II.13, fol. 29rb.

[66] Avicenna, *Canon* IV.3.3. See Bernard de Gordon, *Lilium,* fol. 13rb. Also, "item mores mali et dolosi propter adustionem humorum," *De lepra,* in Basel MS D.III.10, fol. 9r. Compare notes 60–61 above.

[67] Thus, in the translation by Campbell and Colton, "evil, crafty habits appear," *Surgery of Theodoric,* 2:171.

[68] See n. 60 and compare n. 61 above.

"they want to meddle too much with people."[69] Even more explicitly medical and non-moral is Albertus de Zanchariis's definition, "*mores mali id est* marked by sadness, deceit and anxiety, due to the abundance of melancholic humor."[70] Jordanus de Turre exempted irascibility, libidinousness, and devious habits from moral censure by attributing these to malfunctions in, respectively, the *virtus vitalis, naturalis,* and *animalis.*[71] Moreover, the behavioral aberrations were stereotypically followed in these diagnoses by references to involuntary, psychological or psychosomatic complaints, particularly to the recurrence of "terrifying melancholic nightmares,"[72] dreams in which the patients were "unable either to shout or to move,"[73] or the feeling "as if their heart were being enclosed and pressed during the night."[74]

In view of the few elaborations we have just gleaned from a large group, the evidence does not bear out the assertion that "the medical writers are generally agreed that lepers threaten society not only through infection but also through their corrupt and evil behavior Nearly always they specify—and thereby warn—that lepers burn with desire for sexual intercourse."[75] In truth, there is a marked contrast not only between the physicians' observations of psychological abnormalities and the preachers' attacks on "evil and corrupt behavior," but also between the diagnoses of excessive libido and the common charges of lechery against lepers and other outcasts. The medical descriptions may have been mistaken in counting among the symptoms of leprosy those human reactions to the onset or to the social consequences of the disease. They were not, however, formulated as warnings against moral threats to society.

The physicians' non-moralizing or "naturalist" stance, in keeping with the Hippocratic tradition, is further illustrated by the way in which they argue against sexual activity by lepers With regard to the risk of contagion, even Bernard's earlier quoted warning that the healthy should take precautions or else be prepared "for the gourd, life under the stars, and everlasting disgrace" should be read, I think, as prompted by a medical or at least a humanitarian, rather than a moral, concern. With regard to the question of whether sex is beneficial or even advisable for the lepers themselves, the physicians' answer was invariably and emphatically negative but clearly secular. Thus, Bernard taught that, contrary to "the common belief (*vulgaris opinio*) that coitus is not only beneficial but even therapeutic for leprosy, it is not advisable because all lepers are radically cold and dry as a result of the disease's nature"—and, of course, sex had a drastic cooling and drying effect. Bernard further added that "coitus stirs the humors, mixes the poisonous matter with the humors," and thus spreads the infection through the entire body[76] An almost identical explanation is given by Albertus de Zanchariis, who also more generally advised leprous patients to avoid "superfluous physical exertion and mental strain."[77]

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[69] "Sunt astuti et dolosi et nimis se ingerere volunt populo," *Iudicia,* in Basel MS D II 13, fol 29ra Compare Guy de Chauliac, *Cyrurgie,* ed Ogden, p 380 See also n 61 above

[70] *Glose,* in Paris BN MS 7148, fol 30r Compare, "propter adustionem humorum" in n 66 above

[71] *De lepra nota,* in Basel MS D I 11, fol 97vb Similarly, Bernard de Gordon, *Lilium,* fol 15rb

[72] Bernard de Gordon, *Lilium,* fol 13rb Compare "sompnia mala gravia ponderosa prementia vel terentia habere consuevit ut quod vidit bufones serpentes aut sepe incubum patitur," *Signa,* in Vatican Pal MS 1207, fol 18r, "sompnia melancolica id est terribilia ut sompniet se videre tenebras et res nigras," Albertus de Zancharus, *Glose,* fol 30r, "sompnia terrorem inferentia," Jordanus de Turre, *De lepra nota,* fol. 97vb

[73] "Sompnia terribilia, nec possunt clamare nec se movere," *De lepra,* in Basel MS D III 10, fol 9r

[74] *Circa examen,* in Vienna NB MS 5511, fol 66v Compare "in sompno ponderositas," Jordanus de Turre, *De lepra nota,* fol 97vb, and "quasi gravedo maxima super corpus," Albertus de Zancharus, *Glose,* fol 30r, or, "heuy dremes and grete," Guy de Chauliac, *Cyrurgie,* ed. Ogden, p 380

[75] Brody, *Disease of the Soul,* p 52 In support of the suggestion that European medical texts, unlike those of Islamic medicine, emphasize the "segregation and moral condemnation of lepers," a citation of the behavioral symptoms (most of which, ironically, also occur in Avicenna) is the only reference given by Michael Dols, "The leper in medieval Islamic society," *Speculum,* 1983, *58* 913 and n 123

By emphasizing that these explanations were "natural," I do not intend to deny that, as justifications of an injunction against sex, they reinforced the moral taboos and popular fears towards leprosy. Furthermore, the Aristotelian-Galenic qualitative tradition tended to cast medical definitions of leprosy (perhaps even more than of other illnesses) in terms derived from value judgments. Such terms complemented the emblematic or metaphorical categories of non-medical usage and, especially in translation or when quoted out of context, they are bound to sound moralizing to a later age steeped in scientific quantification and positivist "objectiveness "[78] For example, when medieval physicians characterize leprosy as *malus morbus*, the ambiguous notion of "bad" or "nasty" may become morally charged in the translation as "an evil disease."[79] Similar pitfalls are inherent in the definitions of leprosy as *error virtutis* (apparently "error of virtue" but actually "malfunction of a faculty") and as *peccatum humoris* (which sounds like "sin of a humor" but means "humoral defect"), caused by *malitia complexionis* (not "malice" but "imbalance" of complexion), and resulting in *corruptio formae et figurae* or in further *corruptio virtutis* (literally "corruption of virtue" but actually "breakdown of a faculty").[80] A related but independently significant problem, that was mentioned earlier in connection with etiology but that also affected the diagnosis of leprosy, lay in the supremacy of humoral-complexional theories or, rather, dogmas. In spite of these and other fundamental flaws in pre-modern medicine as a science, I would argue that the medieval physician's scientific autonomy and spirit of inquiry contributed towards making the social judgment and treatment of lepers less irrational or haphazard—a role they may also have played with regard to witchcraft. When these contributions are given due consideration, they will soften the frequently harsh modern assessments such as the view that the physician's "accomplishment was profoundly important: he helped to shape the attitudes of his society, to create an atmosphere in which a disease, sufficiently horrible in itself, was viewed with unnecessary fear, loathing, and condemnation."[81]

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[76] *Lilium*, fol 16ra. Compare, "þai schal eschewe fro lecherye and fro all þing þat may chaufe here nature, as Avicen saith," Guy de Chauliac, *Cyrurgie*, ed Ogden, p 385

[77] *Glose*, in Paris BN MS 7148, fols 35r and 36v

[78] While the *Fachsprache* of medieval physicians has been studied from a philological standpoint, and in connection with liberal arts traditions, or for the changing treatment of various themes, it still awaits a linguistic analysis with regard to "constructs" and *mentalités*

[79] Thus, *Surgery of Theodoric*, trans Campbell and Colton, 2 167, where the adjective "evil" occurs six times

[80] Virtually all these terms, scattered throughout the latinized writings of Galen and Avicenna, are found accumulated in Bernard de Gordon's chapter on leprosy

Another contribution of the physician, and perhaps his most underrated one, was not so much conceptual as practical: it consisted of his increasing involvement in diagnosis, the step in which leprosy became truly a "social" illness. A not uncommon assumption is that

> medieval medicine helped turn fear into an unnatural horror, for it could diagnose a multitude of diseases as leprosy Let someone merely have gross skin lesions and he could be declared a leper In a period when even the most aristocratic lived in filth and bathed irregularly, infection and disfiguring skin conditions were commonplace, and as a result so were diagnoses of leprosy[82]

The careful student will find this verdict largely contradicted by the available evidence. The premise that skin ailments were more prevalent and more readily misclassified than today, is plausible enough. It does not warrant, however, the conclusion that *medical* diagnoses of leprosy were "commonplace," the suggestion that they were pronounced indiscriminately, or the inference that they fostered "unnatural horror." Excavations of leper cemeteries in the last three decades have yielded impressive proof that lepers were identified with a high degree of accuracy.[83] In addition, a considerable number of medical texts document the care and restraint exercised by physicians in their diagnosis. These texts, from chapters "*De signis*" in treatises on leprosy and in practical compendia to instructions for the *examen* or *iudicium* of suspected lepers, await further collation and analysis. Such a textual discussion would lead beyond the scope of this paper, but some preliminary findings may be summarized here.

At first sight, the physicians' descriptions of symptoms appear tradition-bound, diffuse, and rather ceremonial. Hence, it is easy to dismiss them as mere scholastic verbiage and thereby to overlook the subtle yet significant clues to their practical implications and social consequences. Even though the dependence on doctrine resulted in stereotyped semeiologies, it did not preclude personal observations or professional concerns. This is most strikingly illustrated in Bernard de Gordon's lengthy discussion of the question, "whether one could be completely leprous without any notable sign in the face." His drawn-out argumentation for a negative answer may be viewed as a cover for his inability to escape the letter of Galen's teaching and the weight of tradition, since "Avicenna and all the others who compile the signs of leprosy begin with the signs found in the face."[84] More significantly, Bernard's inquiry was motivated by worry, "because it appears to me that lepers are judged very badly in our day."[85] In particular, he had been troubled by doubt after having had to examine a man with horrible lesions of the extremities yet with an unblemished face. Bernard concluded his *quaestio* with the admission that

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[81] Brody, *Disease of the Soul*, p 58 Compare Dols, "Leprosy," p 332 and "Leper in medieval Islamic society," p 913

[82] Brody, *Disease of the Soul*, pp 58–59

[83] An excellent survey of the problems, methods, and findings (especially for Scandinavia) is offered by Richards, *Medieval Leper*, pp 112–20 The objection that suspects may have become leprous *after* having been misidentified and sent to a leprosarium may be offset by the fact that several real lepers died *before* their bones had been affected to a degree recognizable by the paleopathologist

> I wanted to absolve him, and I repeatedly asked him whether any sign had appeared in his face He had remained quite like this for about twenty years, and he still lives with that ugliness of the extremities but without anything showing in the face. Hence I guess, with the conjecture closest to the truth, that it was not leprosy, nor does it seem possible that he would have lasted for so long without his face being disfigured. And therefore, even though I once thought differently, now that I have labored diligently in this work, I am of another opinion and I would no longer judge him leprous However, God knows the truth, I do not know[86]

While Bernard's admission typifies the helplessness of the scholastic diagnostician, it clearly demonstrates the physician's desire not only to close the gap between conjecture and certainty but also to limit the number of fateful verdicts. The same desire seems at work in the further development of diagnostic guidelines. Following the principle that the accuracy of a judgment would be in proportion to the number of converging symptoms observed, successive compilers kept expanding the catalogue of signs.[87] This quantitative change, evident in a juxtaposition of Avicenna's chapter on leprosy with that of Bernard de Gordon and with the later *iudicia,* was accompanied by qualitative refinements. The symptoms or even the steps of the procedure were numbered, in order both to underscore its elaborateness and to provide a ready checklist[88] Quicker consultation of the guidelines was also facilitated by the insertion of rubrics,[89] and even more by the systematic arrangement of the items. While Arnald de Villanova's treatise was still rather amorphous, Bernard de Gordon's paragraphs were organized more logically, but Jordanus de Turre—"at the request of our beloved colleagues, bachelors and scholars,"—drew up a synoptic table of the signs found, respectively, in impaired functions of the faculties, in effluvia, and in changes of appearance.[90] Even Arnald had recommended that, "in order to make a proper examination, you should draw up a table and write the good signs on one side, the bad signs on the other side, and thus you will not err."[91]

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[84] *Lilium,* fol 14va.

[85] *Ibid*, fol 15ra.

[86] *Ibid*, fol 15rb

[87] "Qui jugier velt, qu'il ne gart mie seulement à i ensegnement mais à ij, ou à iij, ou à iiij ou autant com il porra plus, car tant com li ensegnement s'acordent plus ensamble, si sera plus drois li jugemens," Aldobrandino da Siena, *Le régime du corps* [written in 1256], ed Louis Landouzy and Roger Pépin (1911, reprint ed, Geneva Slatkine, 1978), p 202 The principle is reiterated in most of the contemporary and later diagnostic writings on leprosy

[88] Thus, a numbered breakdown of the *Signa Arnaldi de Villanova* is inserted in the margin, and an itemized list of examining steps is added at the bottom of fol 19v in Vatican Pal MS 1207 The diagnostic paragraphs of Guy de Chauliac are tallied in the *Iudicia leprosorum* with the opening line, "Circa iudicia leprosorum 16 sunt notanda," in Basel MS D II 13 And a fifteenth-century Schlagl MS, Codex Plagensis 102 (822 215), fol 144r, contains *Signa 45 lepre collecta ab omnibus auctoribus medicine* (Microfilm no 3120 at the Hill Monastic Manuscript Library, St. John's University, Collegeville, Minnesota)

[89] This feature is most prominent in Vienna MS 5511, fols 65v–67r

The most important qualitative development may lie in the attempts to enhance the precision of the descriptions and to improve the specificity of the tests. It should be noted that, even when stereotyped, the medical accounts are far more precise than devotional and literary references to such phenomena as "white scales" or "bleeding sores."[92] Furthermore, several descriptions of lepromatous lesions are so meticulous that, though often groping for words, they narrow the margin of error and even of confusion with closely parallel syndromes as in the case of tertiary syphilis.[93] The guidelines also prescribe several tests whose specific accuracy has been noted by historians, particularly the tests for the local loss of sensation in neural leprosy.[94] Many of the diagnostic techniques seem of dubious value and were characterized by Sudhoff as "half or completely superstitious in nature."[95] These include various applications of uroscopy and methods reminiscent of divination rituals[96] or, more specifically, of the ordeal.[97] Some procedures, however, apparently merit scientific re-evaluation[98] For example, the tests in which a leper's blood was reportedly found to clot in the bowl or to feel gritty when rubbed between thumb and index,[99] may have validity in view of the increased platelet adhesiveness in advanced lepromatous leprosy.[100]

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[90] Basel MS D I 11, fol 97v A similar breakdown is followed in Vatican Pal MS 1225, fol 17r

[91] Munich Cod lat. 660, fol 46r

[92] Such references, particularly in hagiography, evidently hark back to Biblical models In iconography, spots covering the entire body were used emblematically to depict not only the leper but also Job and, in early woodcuts, the syphilitic

[93] In these descriptions, which should be collated and analyzed systematically, one finds terms such as *macule rubee, rubores ulcerosi, furfures cum unctuositate, nodi intercutanei, nodositates, eminentie lapidee, durities et tuberositas cutis,* and *dispositio corticis glandiosa* Indeed, "zunehmende diagnostische Sicherheit in der Behandlung der lepromatosen wie tuberkuloiden Form der Krankheit ist erst seit dem ausgehenden 13 Jahrhundert feststellbar," according to Hermann Horger, "Krankheit und religioses Tabu die Lepra in der mittelalterlich-fruhneuzeitlichen Gesellschaft Europas," *Gesnerus,* 1982, *39* 65

[94] From the late thirteenth century on, every diagnostic text refers to pricking various regions of the body *acu* or *stilo* This significant advance over Avicenna and Albucasis was first emphasized by Jeanselme, "Comment l'Europe," p 46

[95] Karl Sudhoff, "Mittelalterliche Aussatz-Proben," *Arch Gesch Med*, 1909, *3* 80

[96] As in the test where one "ponat tria grana salis super cruorem si sal statim resolvitur leprosus est," Basel MS D III 10, fol 9v (and in several of the other less sophisticated texts)

[97] For example, if the suspect's blood "floats on water, he is leprous," Basel MS D III 10, fol 9v, Guy de Chauliac suggests that the examiner may include this test "by cause of solempnyte," *Cyrurgie,* ed Ogden, p 382 Arnald de Villanova prescribes that "super sanguinem debet poni urina et si submergatur signum est lepre, et si non non," *Opera,* fol 214rb

[98] Such a re-evaluation might include not only hematology (see notes 99 and 100 below) but also the intriguing tests for the "oiliness" or *unctuositas* of the skin, for the impairment of motor control, for the muscle atrophy between thumb and index finger, for the "corrosion" of nasal cartilage, for hoarseness, and so on

[99] "He schall knowe whiche manere of flesche it schall be þat byleueth in the clensynge [of the blood], if it be grauelose, granaylose and cluddry," Guy de Chauliac, *Cyrurgie,* ed Ogden, p 381 "Si citissime coagulatur, malum [signum]," Vatican Pal MS 1225, fol 17v. "Arenositas stridens inter digitos cum fricatur aut fuerit unctuosus sanguis, est malus," Vatican Pal MS 1207, fol 19v "Colet sanguinem per nigrum lineum pannum sicut per velum moniale si tunc ibi permanserit arenola sanguinea rubea aut alba tunc est leprosus," Basel MS D II 13, fol 29rb margin

[100] See Ell, "Two puzzling features," p 15

Medieval authors were aware that a clue might be misleading, "*signum fallax*,"[101] and they commonly distinguished between "ambiguous and unequivocal signs."[102] Most also differentiated between the symptoms of incipient and advanced leprosy.[103] It is clear that these distinctions, far from being mere academic exercises, would determine whether the suspect was officially cleared, sent home with a warning, or condemned to isolation.[104]

External evidence confirms that the development of medical guidelines corresponded with the growing importance of diagnosis in private and public practice.[105] Leprosy suspects and their relatives came to the doctor voluntarily, some out of fear upon discovering potential symptoms.[106] Others requested a medical examination seeking to be cleared of their stigma. Among several documents pertaining to leprosy which Michael McVaugh has unearthed in his current research on medieval society and health care in fourteenth-century Spain, a 1310 letter from King James II of Aragon vividly illuminates such a quest. The letter officially exempts Sancia, a widow, from the charge of leprosy by which some people kept defaming her even after she had been cleared in an examination by two distinguished masters of medicine.[107] It may be noted that patients who took the initiative could go to great lengths to obtain clearance, and that they were not necessarily of high social standing. They also might find a physician's favorable verdict contested by other medical practitioners.[108]

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[101] The tendency to hypothermia may indicate leprosy but "tamen signum fallax est quoniam et raris corporibus ex natura accidit et etiam macris," Vatican Pal MS 1225, fol 17r

[102] This distinction, elaborated most fully by Guy de Chauliac, originated with Bernard de Gordon according to Antoinette Stettler-Schar, "Leprologie im Mittelalter und in der fruhen Neuzeit," in Koelbing, *Beitrage*, pp 55–72 See Bernard de Gordon, *Lilium*, fol 13rb

[103] Bernard de Gordon classifies the *signa* into *occulta* ("que significant lepram esse in principio"), *manifesta*, and *naufragii* ("que significant approximationem ad terminum") *Lilium*, fol 13rb

[104] "Ista sunt signa detecta manifesta quibus apparentibus patiens est a populo segregandus Dum tamen non corrumpatur figura et forma nondum est iudicandus ad separationem sed est fortissime commendandus," *ibid* "It is mykel to be taken hede aboute þe examynynge and þe dome of leprous men, þat is þe moste iniurie (i wrong) to sequestre or wiþdrawe þe men þat schulde not be sequestred or wiþdrawen and leue leprouse men with þe peple / If he haue forsothe many even-voycede tokenes and fewe unvoycede tokenes, he ben bitterly to be warned þat þai halde gode gouernance If þai haue forsoþe many euen-voycede tokenes and many unuoycede tokenes, þai schal be wiþdrawn fro þe peple ," Guy de Chauliac, *Cyrurgie*, ed. Ogden, pp 381 and 383

[105] Only an initial and illustrative indication can be given here (see notes 106–110) of the evidence that is still scattered throughout the archives of hospitals, universities, local governments, and royal courts

[106] See Van den Bon, *Sint-Janshospitaal*, p 81

[107] "Fidelibus universis officialibus et subditis suis ad quos presentes provenerint etc Ex parte Sancie uxoris quondam R. Soleri habitatoris loci de Gorga termini de Travadell coram nobis fuit propositum conquirendo quod cum ipsa fuisset de aliquibus personis de infirmitate que dicitur lepra indebite diffamata et hoc verteretur in dubium magister Johannes Ameylus medicus noster maior et magister P de Perpiniane medicus nobilis G de entenza super hiis requisiti examinationem fecerunt de infirmitate predicta et licet ipsi invenerint et examinaverint dictam Sanciam non esse leprosam attamen aliqui dubitantes adhuc dicunt dictam Sanciam esse leprosam Unde ad supplicationem pro parte dicte Sancie nobis factam cum constet per assertionem magistri Johannis dictam Sanciam non esse leprosam et per publicum instrumentum inde factum in testimonium huius rei per dictos magistrum Johannem et magistrum Pm , ideo vobis dicimus et mandamus quatenus ipsam Sanciam habeatis et haberi faciatis excusatam ab infirmitate predicta. Dat. Valenc ii idus April anno MCCCX," Archivo de la Corona de Aragon, Canc reg 144, fol 197r I am grateful to Professor Michael McVaugh for kindly communicating this document to me

[108] Pierre Contier, a physician in Aix-en-Provence, cleared Louis Bermond who had come from Ginasservis (Var) to consult him, but his diagnosis was contested by two barbers in 1435 see Danielle Jacquart, *Supplément* to Ernest Wickersheimer, *Dictionnaire biographique des médecins en France au moyen âge* (Geneva Librairie Droz, 1979), p 229

When, perhaps more commonly, reported lepers were summoned to an examination by order of municipal authorities, the juries were assisted by or composed of practitioners ranging from masters in medicine to surgeons and barbers.[109] The practitioners thereby assumed a task that, until the thirteenth century, had been a prerogative of the clergy.[110] The ecclesiastical setting is still echoed in the tone of more than one medical *ordo examinandi*, especially in the introductory "invocation of divine help" for the examiners and pious "consolatory words" for the examinee.[111] In substance, however, the official *iudicium* became the object of medical rather than clerical competence, as also outside references suggest. In 1324, Marsilius of Padua drew both an analogy and a distinction between priests and physicians who judge, respectively, about "a disease of the soul" which calls for excommunication, and about "a bodily disease for which a person such as a leper must be separated from the company of others lest he infect them."[112] While, as Marsilius argued, "the coercive power to expel lepers" belonged not to the physicians but to the body politic, the power to summon suspects was eventually claimed by faculties of medicine.[113]

It may be by mere coincidence that the expansion of the physicians' involvement in examinations parallelled the rapid decline of leprosy in Europe after 1300 Nevertheless, further studies should include the role of medicine among the many suggested causes for this decline.[114] Even though specific etiology and effective treatment still eluded the scientists for over five centuries, more accurate or at least more careful diagnoses probably made a difference, if only by reducing the number of confirmed cases. In general, the medieval physicians appear to have made a valuable contribution to history by their efforts to narrow the identification of real lepers, by their rational approach to the mystery of leprosy, and by their professional concern with the social aspects of this disease.

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[109] Van den Bon, *Sint-Janshospitaal,* p 81 (for Bruges in 1309), Jeanselme, "Comment l'Europe," p 51 (in Nîmes, 1327) The recorded participation of practitioners increases markedly after 1350 see Danielle Jacquart, *Le milieu médical en France du XIIe au XVe siècle* (Geneva Librairie Droz, 1981), pp 128 and 287–88

[110] Jeanselme, "Comment l'Europe," p 7 Albert Bourgeois, *Lépreux et maladreries du Pas-de-Calais (Xe-XVIIIe siècles)* (Arras Commission départementale des monuments historiques de Pas-de-Calais, 1972), pp. 27–31 Horger, "Krankheit," p 63

[111] "Firste, in clepynge Goddes help, he schall conforte ham and saie þat this passioun or sekenesse is saluacioun of þe soule and noght to say þe trouthe, for if leprouse men were reproued, it were a purgatorie to þe soule. And if þe world haue hem in hate, neuerþelatter God haue hem not in hate 3e, but he loued Lazer, þe leprouse man, more þan oþer men," Guy de Chauliac, *Cyrurgie,* ed Ogden, p 381 Compare the MSS, Basel D II 13, fol 29ra, Vatican Pal 1207, fol 18r, Vatican Pal 1225, fol 17ra, and Vienna 5511, fol 65v Vat. Pal 1225, fol. 17v, concludes· a confirmed leper "cum bonis et consolatoriis verbis a populo segregetur In nomine Patris et Filii et Spiritus Sancti Amen "

[112] Marsilius of Padua, *The Defender of Peace,* trans Alan Gewirth (New York Harper & Row, 1967), pp 148–49 Note that, for Marsilius (and, indirectly, also for Guy de Chauliac see n 111 above), leprosy was not "The Disease of the *Soul*" as it became in the title of Brody's study

[113] For example, in Paris, in 1411 and 1426 see Ernest Wickersheimer, "Les maladies épidémiques ou contagieuses (peste, lèpre, syphilis) et la faculté de médecine à Paris, de 1399 à 1511," *Bull Soc franç hist méd*, 1914, *13* 27 In Mainz, in 1492, Frau Nothburgis was summoned before the medical faculty to clear herself "nackt vom Scheitel bis zur Sohle vom Verdacht des Aussatzes" cited by Lia K. Eckes, "Psoriasis und Lepra im Schicksal gemeinsamer Geschichte Ein Beitrag zur Epidemiologie und Differentialdiagnose," *Der Hautarzt,* 1978, *29* 333

[114] The suggested causes range from improvements in hygiene and diet to economic changes and, paradoxically, from the impact of the plague to displacement by tuberculosis and to outright massacres of lepers A synopsis is offered by Huldrych Koelbing, "Das Aussterben der Lepra in Europa," in Koelbing, *Beitrage,* pp 84–100. See further Jean Tisseuil, "La régression de la lèpre ne fut-elle pas aussi fonction de l'évolution économique au XIVe siècle?" *Bull Soc franç path exot*, 1975, *68* 352–55

MEYER, JUNG, AND THE LIMITS OF ASSOCIATION*

Ruth Leys

In July 1907, Adolf Meyer, director of the Pathological Institute of the New York State Hospitals in New York City, requested from Carl Gustav Jung in Zurich a galvanometer for the purpose of carrying out word-association tests. Jung promptly replied, welcoming Meyer's interest in his work, and a correspondence was begun.[1]

At the time, Jung's tests had begun to attract attention among psychologists and psychopathologists because of the confirmation they seemed to give to Freud's psychoanalytic theories. Jung had begun his experiments around 1904 under the leadership of Eugen Bleuler, director of the famous Burghölzli Psychiatric Hospital in Zurich. Briefly described, the word-association tests measured the time required for a subject to give spontaneous verbal associations to selected stimulus words. Rooted in association psychology, the tests had first made their appearance in Wilhelm Wundt's experimental laboratory program and in the experimental psychopathology of Emil Kraepelin, Robert Sommer, Theodore Ziehen and others. Those earlier scientists had expected such tests to reveal intellectual differences between individuals, and had subjected the results obtained to formal principles of classification. But Jung and his associates at the Burghölzli took the association test in a new direction by showing that it was not intellectual but emotional factors that played the determining role. By demonstrating that the feelings or emotions associated with a constellation or "complex" of ideas evoked by specific stimulus words significantly delayed a subject's reaction time, Jung provided corroboration of Freud's view concerning the vital importance of repressed emotional conflicts in psychic life.[2]

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[1] Carl Gustav Jung to Adolf Meyer, 10 July 1907, Adolf Meyer Papers, The Alan Mason Chesney Medical Archives, The Johns Hopkins Medical Institutions, Baltimore, Maryland Unless otherwise stated, all letters and related material cited in this paper are in the Chesney Archives Meyer's letter, apparently to Frederick Peterson, which initiated the correspondence with Jung, is missing

[2] Useful accounts of the development of the word-association test are given by Jung himself see C G Jung, "The Psychological Diagnosis of Evidence" (1905) and "The Psychopathological Significance of the Association Experiment" (1906) in *The Collected Works of C G Jung*, ed. William McGuire et al, 20 vols (Princeton Princeton University Press, 1953–79), vol 2, *Experimental Researches*, trans Leopold Stein with Diana Riviere (1973), pp 318–20, 408–15 See also John C Burnham, *Psychoanalysis and American Medicine, 1894–1918 Medicine, Science, and Culture* (New York International Universities Press, 1967), pp 18–19

Bull Hist. Med., 1985, *59* 345–360

Jung's work with word-association tests brought him into personal contact with Freud and, by the summer of 1907, Jung had come to be recognized as one of Freud's principal followers. Psychoanalysis was then under frequent attack, and Jung therefore welcomed an expression of interest from Meyer, who, as one of the leaders of the advance guard in American psychiatry, seemed likely to bring impressive support for the cause. Jung already had an indirect acquaintance with Meyer. In 1906 Meyer's associate at the Manhattan State Hospital in New York, George H. Kirby, had briefly visited Jung in Zurich, and in early 1907, at Meyer's suggestion, the New York neurologist Frederick Peterson had spent several weeks in Zurich with Jung.[3] Peterson and Jung had joined in experiments on the psychogalvanic reflex, a variation of the word-association test that measured emotional responses by recording changes in the electrical resistance of the skin. Two papers describing the experiments had been published in 1907, and it was the apparatus used in those experiments that Meyer wished to obtain.[4]

For his part, Meyer had been following Jung's experiments from the moment they were first published. For some years, Meyer had been evolving an approach to mental illness based on the pragmatism of William James and on the Chicago school of functional psychology led by John Dewey Prior to his contact with Jung and psychoanalysis, he had attacked the somaticism and, as it seemed to him, the pessimism that then prevailed in psychiatry, and had proposed instead a dynamic interpretation of mental illness based on the causal role of psychological factors Rejecting the formal, descriptive methods of Kraepelin and his school, Meyer had begun to develop a functional or "psychobiological" approach according to which the chief function of the mind was to help the organism adjust efficiently to the environment on the model of Darwinian adaptation Applying this functional conception to the study of the psychiatric patient, Meyer argued that early, abnormal habits of thought and behavior produced inefficient adaptations or "reaction patterns" in later life, and he stressed the importance of training in good habits in order to prevent and if necessary treat mental disease.[5]

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[3] Cf Ruth Leys, "Meyer's dealings with Jones· a chapter in the history of the American response to psychoanalysis," *J Hist Behav Sci*, 1981, *17* 446

[4] C G Jung, "On the psychophysical relations of the associative experiment," *J Abnorm Psychol*, 1907, *1* 247–55, Frederick Peterson and C G Jung, "Psychophysical investigations with the galvanometer and pneumograph in normal and insane individuals," *Brain*, 1907, *30(2)* 153–218 Both are reprinted in Jung, *Collected Works*, 2 483–91, 492–553 William McGuire has recently shown that Jung served as a test subject in Ludwig Binswanger's related psychogalvanic experiments carried out in early 1907 See William McGuire, "Jung's complex reactions word association experiments performed by Binswanger," *Spring An Annual of Archetypal Psychology and Jungian Thought*, 1984, pp 1–34

[5] Gerald N Grob, "Adolf Meyer on American psychiatry in 1895," *Amer J Psychiat*, 1963, *119* 135–42, *idem, The State and the Mentally Ill A History of Worcester State Hospital in Massachusetts, 1830–1920* (Chapel Hill University of North Carolina Press, 1966), *idem, Mental Illness and American Society, 1875–1940* (Princeton Princeton University Press, 1983), Nathan G Hale Jr , *Freud and the Americans The Beginnings of Psychoanalysis in the United States, 1876–1917* (New York Oxford University Press, 1971), pp 157–64, Gerald Klerman, "The Psychobiology of Affective States The Legacy of Adolf Meyer" in Eugene Meyer and Joseph V Brady, eds , *Research in the Psychobiology of Human Behavior* (Baltimore The Johns Hopkins University Press, 1979), pp 115–31, Christine Mary Shea, "The Ideology of Mental Health and the Therapeutic Liberal State· The American Mental Hygiene Movement, 1900–1930" (Ph D. diss , University of Illinois at Champaign-Urbana, 1980), and Barbara Sicherman, "The Quest for Mental Health in America, 1880–1917" (Ph D diss , Columbia University, 1967)

As Burnham has noted, there were close ties between Swiss and American psychiatry early this century, involving a number of complex factors.[6] Chief among these was the affinity between Meyer's approach to schizophrenia and that of the Swiss school. On the basis of his functional theories, Meyer suggested that some individuals responded to stressful situations with a "schizophrenic reaction" because they had developed habitually inadequate ways of adjusting to their environment. He thus inaugurated a search for the specific dynamic factors that led to schizophrenic reactions, and introduced a practical, optimistic emphasis on the possibility of preventing the disease by the timely adjustment of life habits. Meyer's view that schizophrenia was not always the inexorably deteriorating disease process that Kraepelin had taken it to be corresponded to the organic-dynamic view of Bleuler and his Burghölzli staff that schizophrenia could occur in mild cases which, with proper care, had a good chance of recovery. In this context, Jung's word-association tests appealed to Meyer because they provided an experimental procedure by which the causal role he attributed to life experiences in the production of mental disease could be brought to an objective test.[7]

The importance Meyer attached to Jung's word-association tests may be gauged by the frequency with which between 1905 and 1908 Meyer reviewed the contributions of Jung and others in this area.[8] His appreciative notices were important in establishing Freud's and Jung's early reputations in the United States. Starting in 1906, Meyer also encouraged members of his staff to use the word-association test in their work.[9] Jung's experiments appear to have stimulated Meyer's engagement with Freud's theoretical writings. His favorable notice in 1906 of Freud's *Three Essays on the Theory of Sexuality* was the product of this involvement,[10] as was a laudatory review a year later of Jung's *The Psychology of Dementia Praecox*, a pioneering work which demonstrated that Freud's theories were applicable not only to the neuroses but to the psychoses as well. Meyer's review hailing Jung's book as a "great achievement" was published in June 1907, a month before the correspondence between the two men began.[11]

In the course of their 1907 correspondence, Meyer and Jung exchanged views on a number of topics of common interest. Jung hoped that Meyer, who was travelling in Europe that summer, would be able to observe his association experiments during a projected visit to Zurich, but the meeting did not materialize He complained to Meyer about the hostility of the German psychiatrists towards psychoanalysis and indeed towards psychological analysis generally and described the discussions then going on at a local Freudian society he had helped organize. Meyer not only shared Jung's criticisms of German psychiatry but was ready to go even further. whereas Jung was still inclined to refer the psychological disturbances of schizophrenia to concomitant toxic changes in the brain, Meyer urged on Jung the necessity of adopting a strictly psychogenic approach to the disease. An omen of the subsequent distance between the two men and of Meyer's later questioning of the scientific validity of psychoanalysis was his refusal of Jung's suggestion that he give a position at the New York Pathological Institute to the future psychoanalyst Abraham Arden Brill, who visited Jung in November 1907. This request Meyer denied because he felt Brill lacked "objectivity" and moreover was not personally liked by himself or his colleagues.[12]

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[6] Burnham, *Psychoanalysis and American Medicine*, pp 128–29

[7] Solomon Katzenelbogen, "Dementia praecox formulation by Kraepelin, Bleuler and Meyer," *Psychiat Quart*, 1942, *16* 436–53, Hans Kind, "The psychogenesis of schizophrenia a review of the literature," *Inter J Psychiat*, 1967, *3* 383–97

[8] Adolf Meyer, "Normal and abnormal association," *Psychol Bull*, 1905, *1* 242–59, *idem*, "Application of association studies," *ibid*, 1906, *3* 275–80, *idem*, "Galvanic reactions and associations," *ibid*, 1908, *5* 273–74

[9] See Meyer to Mary Meyer, 27 September 1906

[10] Adolf Meyer, "Interpretation of Obsessions" (1906) in *The Collected Papers of Adolf Meyer*, ed Eunice E Winters and Anna Mae Bowers, 4 vols (Baltimore The Johns Hopkins Press, 1950–52), 2 633–35

[11] Meyer, "Dementia Praecox," in *Collected Papers*, 2 489–90

For the purposes of this paper, the most interesting aspect of the exchange between Meyer and Jung is the latter's warning to Meyer about the difficulties involved in interpreting objective tests in psychoanalysis. Jung was pleased to learn that Meyer had been carrying out word-association experiments. But he cautioned that although such tests generated independently verifiable evidence concerning the emotional responses of individuals, the precise relevance of the data in each case was difficult to assess. "I am interested to hear that you too have done some association experiments," Jung wrote to Meyer. "I think you will meet with major difficulties in such work, for the path to definitive results is thorny." He went on:

> This is because the experiment yields nothing but the guidelines for psychoanalysis, as it were, as mapped out by Fraunhofer, in dealing with which one is still faced with the difficult task of proving their relevance to individual elementary materials The significance of certain lines is fairly well known to us empirically, others (and this is the largest part) are unknown to us; here is where the analysis must start, which so far still depends largely on the individual routine and the patient's cooperation[13]

Jung noted in a subsequent letter that his association method had been misunderstood in this regard. He observed that his method indicated only that whenever reaction time was disturbed, a complex was at work. It did not follow that one could automatically call forth a specific complex by means of arbitrarily chosen stimulus-words.[14]

At that very moment, the Harvard psychologist Hugo Münsterberg was aggressively publicizing in the popular press the value of word-association tests for the purposes of lie detection in criminal law, and both Meyer and Jung commented on this in their correspondence.[15] For his part, Meyer deplored the sensationalism of Münsterberg's work, while Jung expressed concern about the methodological difficulties involved Thus Jung reported to Meyer that he and his associates had been performing association tests on criminals imprisoned before trial but that he was still skeptical about the practical use of such a procedure. Jung's remarks must be understood against the background of previous efforts he had made along these lines. In an experiment first published in 1905 and familiar to Meyer, Jung had exposed a suspected thief by measuring the disturbances in the man's reaction times to a series of critical stimulus words. But Jung had gone on to demonstrate in a control experiment that the results of the test were ambiguous because the *same* critical stimulus words caused disturbances in innocent people. These results were discouraging, Jung had admitted, but they served to bring home the "fundamental weakness" of the association test This was the "multiplicity of meanings that the stimulus words can have One can hardly imagine how many associations, both concrete and symbolic, such words can arouse."[16] In the last resort, Jung had concluded, the correct interpretation of the test results depended on the experimenter's experience and his knowledge of the patient based upon the clinical relationship. The association tests might facilitate the investigation of the pathological complex, they might even be used to shorten an individual's psychoanalysis, but they could not supplant the work of analysis itself.[17]

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[12] Jung to Meyer, 10 July 1907, 22 July 1907, 19 November 1907, Meyer to Jung, 10 November 1907, 12 December 1907 For Jung's views on the cause of schizophrenia, see Sigmund Freud and C G Jung, *The Freud/Jung Letters The Correspondence Between Sigmund Freud and C G Jung*, ed William McGuire, trans Ralph Manheim and R. F C Hull (Princeton Princeton University Press, 1974), pp 19, 20, 142

[13] Jung to Meyer, 10 July 1907 Jung takes the discovery of spectrum analysis by the German astronomer Joseph von Fraunhofer (1787–1826) as an example of the difficulty of interpreting the results of association experiments, although the two classes of phenomena have nothing in common I am indebted to Mrs Aniela Jaffe and Mr Franz Jung for the interpretation of this reference Passages quoted in this article from the correspondence between Meyer and Jung have been translated by Elborg Forster and Mark Anderson.

[14] Jung to Meyer, 19 November 1907

One senses in Jung a certain regret about this state of affairs. He aimed to make psychology an empirical science; he viewed Freud's psychoanalysis as a valuable investigatory technique in this regard and believed his own word-association tests helped advance the same basic project. Jung wrote to Meyer: "I have been working for some time trying to find empirical rules of psychoanalysis, which is not an easy task. With psychoanalysis one can take the wrong path, but the association experiment is an absolutely sure guide."[18] Yet he had earlier acknowledged that the method was "difficult and dangerous." Only when one had completely assimilated Freud's method, he had observed, "is one able with any certainty to consider associations from a psychoanalytic point of view. It has to be conceded ... that an inexperienced experimenter can easily make the gravest mistakes with this delicate material."[19]

In fact, Freud early on was inclined to discount the value of the association test on precisely these grounds. In 1906, for example, he observed that in applying the test to criminal law, it was difficult to distinguish a real criminal from an innocent neurotic who, out of a lurking sense of guilt not connected with the crime in question, nevertheless seizes on the accusation raised against him and responds accordingly.[20] In 1909 Freud stated that, although the test was indispensable for intractable cases of schizophrenia, he himself made practically no use of it in the analysis of neurotics and saw no advantage in it over his own technique of free association.[21] Later, after his break with Jung, Freud's attitude towards the association test hardened. "In psychoanalytic treatment," he wrote in his *History of the Psychoanalytic Movement*, "association-experiments enable a provisional, qualitative analysis of the case to be made, but they furnish no essential contribution to the technique and can be dispensed with in carrying out analyses."[22] More generally, Freud saw little need for an experimental confirmation of psychoanalysis on the grounds that the wealth of evidence on which its assertions rested made them independent of experimental verification.[23]

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[15] Matthew Hale Jr , *Human Science and the Social Order Hugo Munsterberg and the Origins of Applied Psychology* (Philadelphia Temple University Press, 1980), pp 111–21

[16] Jung to Meyer, 19 November 1907

[17] Jung, "Psychological Diagnosis of Evidence," pp 348, 358, and *idem*, "Psychoanalysis and Association Experiments" (1906) in *Collected Works*, 2 288–317

[18] Jung to Meyer, 10 July 1907

[19] Jung, "Psychological Diagnosis of Evidence," p 331

Nor was Meyer insensitive to the hermeneutical problems raised by objective tests in psychoanalysis. But he did not regard those problems as insurmountable. The complexities of the word-association test were "inevitable," he wrote in an appreciative review of Jung's studies in criminology, but not "*necessarily* forbidding." Recognizing that not everyone was equally talented at making subtle inferences, he argued that the rehabilitation of such tests as truly scientific would depend on refining the skill and critical judgment of the investigator and on the habit of repeated test and countertest [24] Implicit in Meyer's attitude was the assumption that the investigation of the human mind *could* be made to conform to the norms and methods of the natural sciences. This was to be achieved not by adopting the mechanical, reductionist perspective of the physical sciences, but rather on the basis of a functional, biological approach that would seek to do justice to the actual lived experiences of the human subject. Meyer welcomed Jung's word-association tests precisely because they helped specify empirically and concretely the dynamic factors in mental life and thus served to "operationalize" the rather mysterious concepts with which he and the Freudians worked In short, Meyer viewed Jung's tests as an important step towards objectivity in psychopathology and as a significant contribution to the functional program of extending the experimental method to areas previously considered inaccessible to science.

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[20] Sigmund Freud, "Psychoanalysis and the Establishment of the Facts in Legal Proceedings" (1906) in *The Standard Edition of the Complete Psychological Works of Sigmund Freud,* ed and trans James Strachey et al, 24 vols (London Hogarth Press and the Institute for Psychoanalysis, 1953–74), vol 9, *Jensen's 'Gravida' and Other Works* (1959), p 113.

[21] Freud to Oskar Pfister, 9 February 1909, in Sigmund Freud and Oskar Pfister, *Psychoanalysis and Faith The Letters of Sigmund Freud and Oskar Pfister,* ed Heinrich Meng and Ernst L Freud, trans Eric Mosbacher (New York Basic Books, 1964), p 17

[22] Freud, *Standard Edition,* vol 14, *On the History of the Psychoanalytic Movement,* trans. Joan Riviere (1967), p. 28. The book was originally published in 1914

[23] See David Shakow and David Rapaport, *The Influence of Freud on American Psychology* (New York International Universities Press, 1964), p 129 Ellenberger observes that Jung himself, after several years of intense application of the word-association test, eventually ceased using it altogether on the grounds that experimental psychology was largely irrelevant to human psychology See Henri Ellenberger, *The Discovery of the Unconscious The History and Evolution of Dynamic Psychiatry* (New York Basic Books, 1970), p 694 But see Jung, "On the Psychological Diagnosis of Evidence The Evidence-Experiment in the Naf Trial" (1937) in *Collected Works,* 2. 605–14, in which Jung made use of the word-association test in the psychological examination of a defendant in a trial

[24] Meyer, "Application of association studies," pp 279–80

However, the very terms of Meyer's interest in Jung's experiments contained the seeds of the frustration, indeed the disapproval, he was soon to feel with regard to psychoanalysis. For in ways that anticipated the revisions of psychoanalysis attempted by Heinz Hartmann, David Rapaport and others, Meyer's commitment to an ideal of empirical objectivity led him to confront psychoanalysis with the demand that it reformulate its theoretical concepts in functional terms in order to submit itself to the same critical standards of empirical verification that were met in the other natural sciences. But as Jung's letters to Meyer in 1907 suggest, psychoanalysis was already proving singularly resistant to being operationalized in this way. What mattered in psychoanalysis, as it was developed by Freud and his early followers, was not the amassing and verification of facts as known to the outside observer, but rather the meaning those facts assumed in the individual's psychic history—a meaning, Freud argued, that could only be construed under the conditions of transference and within the analytic situation. In this sense, the "data" of psychoanalysis were so enmeshed in, so much a product of, the relationship between analyst and analysand that objective tests could have only a limited value.[25]

The momentous disjunction between Meyer's empirical ambitions and Freud's interpretive strategies was not at first apparent. As Hale has observed, in the beginning Meyer believed that he and the psychoanalysts were exploring the common ground of a functional interpretation of mental disease.[26] The correspondence between Meyer and Jung in 1907 testifies to the spirit of common interest and respect that in the first phase of their acquaintance existed between them, a respect that was solidified when they met for the first time in Zurich in the summer of 1908.[27]

Within a year of that meeting, however, the relationship subtly began to change. Meyer's reaction to the celebrated conference held at Clark University in Worcester, Massachusetts, in September 1909 is revealing in this regard. Meyer was among those assembled on that famous occasion when Freud, accompanied by Jung and Sandor Ferenczi, arrived in the United States to lecture for the first and only time on psychoanalysis to an American audience. Meyer participated in the proceedings with a lecture summarizing his functional interpretation of schizophrenia and used the opportunity to praise Freud's and Jung's similar contributions to the explanation and treatment of mental disease.[28]

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[25] For attempts to reformulate psychoanalysis in terms acceptable to empirical psychology, see Paul Ricoeur, *Freud and Philosophy An Essay in Interpretation* (New Haven and London Yale University Press, 1970), pp 344–75

[26] N Hale Jr , *Freud and the Americans,* p 198

[27] For Jung's early positive response to Meyer, see *Freud/Jung Letters,* pp, 170–71

[28] Meyer, "Dynamic Interpretation of Dementia Praecox," (1909) in *Collected Papers,* 2 443–58

Freud's distrustful response to the American reception of psychoanalysis is well known. He feared a too easy acceptance by the Americans would tame and domesticate the radicalism of his essential doctrines. In this he was not entirely mistaken. Nevertheless, for some Americans already impressed with Freud's work, the Worcester meeting gave them a chance to deepen their grasp of psychoanalysis. A few weeks after the Clark conference, for example, Meyer's close friend and eventual successor at the Pathological Institute, August Hoch, went to Zurich for several weeks of work with Jung. Hoch's letters to Meyer from Zurich give a fascinating glimpse of the struggle then taking place in Europe between Kraepelin's descriptive psychiatry and Freud's dynamic theories, as well as of the stages by which contact with Jung's powerful personality served in Hoch's case to increase his confidence in the validity of psychoanalytic procedures. At first Hoch was skeptical and even repelled by what seemed to him the cynicism and brutality of some of Jung's interpretations, especially those in the sexual sphere, and he remained aloof from the circle of disciples around Jung. As he got to know Jung better, however, his knowledge and approval of psychoanalytic methods grew, and he became outspoken in his criticisms of those who had only a superficial understanding of Freud.[29] Hoch, who suffered from periodic depressions, underwent a brief personal analysis with Jung, and this seems to have helped cement his adherence to psychoanalysis at this time.[30]

Meyer's reaction to the Clark conference was different. It is worth stressing in this context, as Burnham has done, the great importance of Swiss psychiatry and psychoanalysis to the early reception of Freud in the United States. Whereas Meyer's contacts with Freud were minimal—they met only twice, in 1909 at the Worcester meeting and again in 1923 during an afternoon visit Meyer made to Freud's home in Vienna—Meyer had several contacts with Jung in the early years of the psychoanalytic movement and the feelings Jung aroused in him were often intense. Indeed, it seems fair to suggest that affective factors played a role in shaping Meyer's response to psychoanalysis and in particular towards Jung, and that those factors were aggravated by the fact that Meyer, too, was Swiss by birth. A dream Meyer recorded shortly after the Worcester conference reveals strongly ambivalent feelings—a mixture of attraction and rivalry toward Jung.[31] In any case, Meyer, who tended to be reserved, was disinclined to subordinate his own thoughts and personality to another's. As he himself stated a short while later in connection with psychoanalysis, he was constitutionally incapable of espousing a new theory with the enthusiasm that others lavished on it and required instead that new conceptions be integrated into the body of what he considered already well established facts.[32] Unlike Hoch, Meyer never underwent a personal analysis. But he remained in personal contact with Jung and defended him when the latter's blunt references to sexual factors in mental disease offended Meyer's more conservative American colleagues.[33] Moreover, as Hoch and others in Meyer's circle began to elaborate Jung's dynamic theories of the psychoses, they drew attention to the general parallels between Meyer's functional interpretation of schizophrenia and the Freudian view of the same phenomena, a resemblance Meyer willingly embraced.[34]

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[29] August Hoch to Meyer, c. 1 November 1909, 22 November 1909, c. December 1909.

[30] Jung to Freud, 25 December 1909, 30 January 1910, in *Freud/Jung Letters*, pp. 171 and 289.

[31] The dream (recorded in English) is dated 16 October 1909. It was found in the Adolf Meyer Papers in a sheaf of notes labelled "Freud Dream Complexes," dated 1909–11, comprising miscellaneous jottings and comments on Freudian theory, particularly the dream mechanisms. The dream, which Meyer did not attempt to analyze, is set in Worcester and Zurich.

All in all, Meyer's response to the Clark conference was not unlike that of William James, who was impressed with Freud but viewed him as a man "obsessed with fixed ideas," and who remained convinced that functional psychology was the "real psychology."[35] Indeed, Freud's visit to the United State reinforced Meyer's determination to legitimize his own functional conceptions in the eyes of his scientific colleagues. From this point of view, the most significant result of the conference was Meyer's decision to embark immediately on a lengthy correspondence with the dean of academic psychology, Edward Bradford Titchener (who also had spoken at Clark), in an effort to explore the possibility of bringing about a reconciliation between the seemingly disparate positions that had been aired at Worcester.

It is a measure of Meyer's desire to achieve consensus that he should have chosen to correspond with and in effect to debate Titchener who, as Hale has observed, represented the "introspectionist," experimental tradition in psychology at its most rigid.[36] Struck by the contrast between the dynamic approach to mental events exemplified by Freud, Jung, and himself on the one hand and Titchener's descriptive approach on the other, but encouraged by his friendly contact with Titchener at the Clark conference, Meyer decided to see whether their differences might be overcome.

The correspondence that ensued is long and intricate, but what particularly deserves stressing is the importance Meyer attached to the word-association test as confirming the validity of his functional approach.[37] Titchener in his letters dismissed Meyer's work as unscientific. Meyer countered, however, that Jung's word-association tests decisively undermined Titchener's psychology of consciousness and the dualism underwriting it by proving experimentally that unconscious or repressed motives actually determine the association of ideas. "When you come . . . to such a problem as Jung's association-phenomena," Meyer stated, ". . . introspective psychology must meet the question: *is the degree of consciousness a safe measure for the psychological determination of the stream of thought?*" At the same time, Meyer expressed his willingness to reformulate psychoanalysis to meet the standards of academic psychology and suggested that Jung's work furnished a natural starting point for such an operation: "You said Freud's psychology was that of two generations ago. Is there any possibility of putting its sound nucleus in terms of the psychology of the present generation? The best place to attempt this would be Jung's complex theory." The Jung complexes, he added, "do indeed offer a very interesting opportunity on which to show how you deal with the dynamic factors, and nothing would be more welcome than to have the formulation of that issue from you or one of your men."[38]

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[32] Meyer to J W Baird, 3 May 1911

[33] See Meyer's letter to Mary Meyer, March 1910, in which Meyer reported a conversation he had had with the neurologist Hugh T Patrick concerning Jung's treatment of a patient during a brief trip Jung made to the United States in March 1910 Jung arranged to see Meyer and Hoch in New York at the end of his visit. See Jung to Meyer, 19 March 1910, and *Freud/Jung Letters*, pp 301–4

[34] August Hoch, "The psychogenic factors in the development of psychoses," *Psychol Bull*, 1907, *4*. 161–69, *idem*, "The manageable causes of insanity," *State Hospitals Bull*, 1909–10, *2* 358–83, *idem*, "On some of the mental mechanisms of dementia praecox," *J Abnorm Psychol*, 1910, *5* 255–73, *idem*, "Constitutional factors in the dementia praecox group," *Proc Amer Medico-Psychol Assoc.*, 1910, *66* 227–38, *idem*, "Review of Bleuler's schizophrenia," *State Hospitals Bull*, 1912–13, *5* 238–59, Charles Macfie Campbell, "Psychological mechanisms with special regard to wish fulfillments," *State Hospitals Bull*, 1909–10, *2* 12–26, *idem*, "The form and content of the psychosis the role of psychoanalysis in psychiatry," *ibid*, 1910–11, *3* 3–21, *idem*, "The application of psychoanalysis to insanity," *New York Med J*, 1912, *95* 1079–81, Meyer, "The Nature and Conception of Dementia Praecox" (1910) in *Collected Papers*, 2 459–66

[35] Ralph Barton Perry, *The Thought and Character of William James*, 2 vols (Boston and Toronto Little, Brown, 1935), 2. 122–23

[36] N Hale Jr, *Freud and the Americans*, p 4

But as these remarks suggest, Meyer was convinced that any such reformulation would have to remain on functional grounds. A psychology of pure introspection which ignored the dynamic factors at work in the mind was, in his view, of little use to psychiatry. Rather, it was necessary to study the patient's mental experiences as a product of his or her overall biological adjustment to the environment. "Every psychological function has also certain physical aspects," he wrote "The spirit with flesh and bone makes the 'mental' reaction and its organ. Science does well to treat them as a unit." Jung's complexes were precisely psychodynamic units of this kind. Accordingly, Meyer argued that the chief task of psychology was to combine introspection with inspection (the objective observation of the patient) in a manner that would do justice both to the patient's subjective experiences and to his or her behavior, while also meeting the same critical experimental standards demanded in the other sciences.[39]

Above all, what must be emphasized is the way in which the Clark conference intensified Meyer's commitment to finding common ground among competing interpretations in psychology and hence made methodological considerations centrally important to him at this time. As the correspondence with Titchener clearly shows, Meyer felt compelled to clarify to himself and others the objective methods that he felt were uniquely qualified to bring about the consensus he desired. Ironically, however, the very methods he proposed would turn out to make such a reconciliation impossible.

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[37] I have analyzed the correspondence between Meyer and Titchener in a paper entitled "Adolf Meyer at Worcester" that was delivered at the annual meeting of the American Psychological Association, Toronto, Canada, August 1984 The correspondence is in the process of being prepared for publication, with commentary, by Rand B Evans and myself

[38] Meyer to Titchener, 23 September 1909

[39] Meyer to Titchener, 18 September 1909, 23 September 1909, 23 October 1909

Earlier, I observed how in the case of the word-association test, Meyer's ideal of objectivity was at variance with the nature of psychoanalytic practice (of psychoanalytic "truth"). A related example concerns Meyer's emphasis on the patient's biography. In his letters to Titchener, Meyer argued on functional principles that psychology had to start, not with the abstract mental elements of Titchener's structural psychology, but with the individual's immediate experiences as these were observed by the physician and elicited in conversation with the patient. The aim was to assess both the patient's physical history and, most important, everything the patient had to say about his or her life experiences, understood as nearly as possible in the patient's own words—in the ordinary or "common sense" language of everyday life The specific institutional practice by which these life experiences were to be recorded was the psychiatric examination, which Meyer inherited from nineteenth-century hospital practice and which during these years he was making the cornerstone of his psychiatric teaching. As eventually formalized and standardized by Meyer, the psychiatric examination, supplemented by various tests to determine the patient's neurological and mental status, constituted the instrument by which all the potentially relevant factors in each case, including crucially the patient's thoughts, moods, feelings and beliefs, as expressed verbally to the physician, could be "objectively" assessed.

All this meant that Meyer was committed to making the patient's life story, the biography, a major focus of attention, an emphasis that seemed to bring his position close to that of psychoanalysis, in which the patient's story or narrative plays a fundamental role. But there is an important sense in which Meyer's methodological assumptions made his conception of biography radically different from Freud's Meyer's conception of scientific method, a conception he regarded as essentially pragmatic, led him to conceive of the facts of a case as available prior to any particular interpretation—if only the investigator knew how to elicit them and make them perspicuous. The psychiatric examination was developed by Meyer as a method for eliciting such positive facts, which he represented accordingly as standing above or in implicit precedence to any particular interpretation and hence as constituting a body of knowledge on which *all* fair-minded investigators must agree. On these grounds he recommended his psychobiological procedures as a solution to the scandal of sectarianism that seemed to him to threaten psychiatry's scientific legitimacy.

But of course a certain interpretation was already inscribed in the methods he advocated Meyer's observational assumptions, his insistence that facts were not facts unless they were public and shared, naturally tended to privilege the conscious mind, where facts, so to speak, were present to both patient and observer, as against the unconscious, whether understood in

Freudian terms or simply as a realm of hiddenness and inaccessibility. (Significantly, in 1912 he would criticize Freud's concept of the transference along just these lines.[40]) It followed that Meyer's notion of biography differed from Freud's. Like the psychoanalysts, he was committed to studying the personality in a temporal perspective. But Meyer's methodological assumptions tended to exclude precisely the concepts of unconscious sexual desire, repressed conflict, and compensatory fantasy that Freud viewed as fundamental and that many psychiatrists through Freud's influence came to regard as essential to a truly biographical understanding of the human subject. That is one reason why several of Meyer's most gifted followers later deserted him for the Freudian cause. By the same token, Meyer's functional conception of the biography had a decisive influence on the ego-psychology revisions of American neo-Freudians such as Harry Stack Sullivan and others.[41]

In the years immediately following the Clark conference, the differences between Meyer's functional, pragmatic approach in psychiatry and the Freudian approach found explicit expression on a number of occasions. For example, in the spring of 1910 Meyer published an important statement about Freud's doctrines for the benefit of the staff of the New York State hospital system. In his discussion, Meyer developed the resemblance between his own functional account of mental disease based on the deterioration and conflict of habits and Freud's psychogenic explanations. In an implicit reference to his correspondence with Titchener the previous year, Meyer defended the right of a scientific psychology to explain human behavior functionally or teleologically—that is, in the light of wishes or purposes—and in this sense reaffirmed the value of Freud's work And he acknowledged that Freud's analysis of dreams, his treatment of the vicissitudes of the sexual instinct, and his emphasis on the role of symbolization, all had made possible a more specific, individual, and searching analysis of cases than had hitherto been done. Meyer illustrated the value of Freud's conceptions in this regard by contrasting traditional, essentially classificatory and descriptive studies of slips of the tongue and other everyday practices with Freud's dynamic, symbolic interpretations of the same phenomena.

Characteristically, however, Meyer was not entirely comfortable with Freud's conception of the sexual libido. In particular, while insisting in his paper on the need for psychiatrists to assess frankly sexual factors in mental disease, Meyer contributed to the desexualization of psychoanalysis that was such a striking feature of the American response to Freud by suggesting that Freud's term "sexual" be replaced by the more general, and more innocuous, terms "Trieb" or "affect" or "go."[42] In trading the sexual core of psychoanalysis for what he took to be common sense in this way, Meyer implicitly repressed the Freudian concept of the unconscious[43] Similarly, in 1910, shortly before his move to the Johns Hopkins University to take up an appointment as professor of psychiatry and director of the Henry Phipps Psychiatric Clinic, Meyer sanctioned the censorship of an article on Freud's psychology by the British analyst Ernest Jones on the grounds that its sexual content would be distasteful to the journal's readers, and a year later decided against appointing Jones to the staff of his Clinic. I have discussed elsewhere these last incidents in detail, as well as a visit Meyer made to Jung's house on the shore of Lake Zurich, on which occasion his attraction to Jung and psychoanalysis mingled with a more cautious and critical attitude.[44]

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[40] Meyer, "Conditions for a Home of Psychology in the Medical Curriculum" (1912) in *Collected Papers*, 3 36

[41] I discuss Meyer's psychiatric practices further in my article "Meyer, Watson, and the dangers of behaviorism," *J Hist Behav Sci*, 1984, *20* 128–49

[42] Meyer, "A Discussion of Some Fundamental Issues in Freud's Psychoanalysis" (1910) in *Collected Papers*, 2 604–17

In a related development, after 1909 Meyer grew more critical of any theory whose interpretive principles or specialized concepts seemed to him to preclude agreement on fundamental issues. The correspondence with Titchener bears witness to this cast of mind. As time went on, he became increasingly dismayed by the inability or unwillingness of his colleagues to subordinate doctrinal differences or what he considered merely terminological disagreements to the larger goal of finding common ground. In order to resolve conflicts of interpretation in the field, Meyer proposed that the same case be brought under the observation of several different investigators—a suggestion that, by conceiving of the relevant data as independent of the transference relationship, implicitly downgraded infantile sexuality and the unconscious in favor of the patient's natural sagacity and the manifest content of the mind.[45] Moreover, Meyer soon began to define his methodological assumptions in national (if not nationalist) terms. He identified his psychobiological approach with American democracy, and on that basis contrasted his methods with the dogmatic sectarianism he felt characterized the more imperialistic European intellectual tradition.[46] Accordingly, in 1912, on the eve of the schism within the European psychoanalytic movement over the sexual issue, Meyer predicted that the desired integration between psychoanalysis and general psychopathology would be more genuine and far-reaching in the United States than in the Old World.[47] It is against this background that the last phase of Meyer's relations with Jung is to be read

In September 1912 Jung traveled to the United States to deliver the famous Fordham University lectures in which he described his chief departures from Freudian principles. Although Meyer does not appear to have attended the lectures, he invited Jung to Baltimore towards the end of his American stay and arranged for Hoch and other interested colleagues to be at Hopkins during Jung's visit.[48] We might wish for more precise documentation about Meyer's attitude at this juncture, but there can be no doubt that this was the crucial and in a sense the climactic moment in Meyer's relations with Jung: to all intents and purposes their association had reached its terminus. This is paradoxical on the face of it, because the issues that threatened so dramatically to come between Jung and Freud brought Jung's views closer to Meyer's than had previously been the case. In particular, Jung's redefinition of the libido as a desexualized "psychic energy," his emphasis on the patient's current problems rather than on infantile conflicts, and his stress on efficient adaptation to reality—all bore an obvious resemblance to Meyer's functional conceptions. Particularly in the area of sexuality, Jung in 1912 put forward a biological, developmental account of the sexual instincts that was far closer to Meyer's functional ideas than to Freud's psychoanalytic perspective. Thus throughout his Fordham lectures Jung consistently sought to describe the significance of sexuality according to the individual's objective adjustment to the environment. This functional, adaptive approach was fundamentally alien to Freud's attempt to ascertain the psychological meaning of sexuality for the subject's personal history as that meaning was revealed in the analytic relationship.[49] Moreover, Jung's conception of the libido as a kind of life force analogous to Arthur Schopenhauer's Will or Henri Bergson's *élan vital* not only diluted Freud's sexual theories but lent support to the efforts of James Jackson Putnam and others on ethical or religious grounds to vindicate the autonomy and freedom of the mind against Freud's psychodeterminism.[50] There is evidence to suggest that Meyer recognized these lines of kinship with Jung.[51] Why then did this development not lead to closer, or at least continued, relations between the two men?

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[43] Burnham, *Psychoanalysis and American Medicine,* p 42

[44] Leys, "Meyer's dealings with Jones," pp 445–65

[45] See Meyer's comments on the analysis of a case of anxiety, reported in the *Journal of Abnormal Psychology,* 1911, *6* 169

[46] Meyer to William Healy, 29 October 1917

[47] Meyer, "Conditions for a Home of Psychology in the Medical Curriculum," p 29

The answer, I suggest, lies chiefly in the methodological considerations on which I have been focusing in this paper. Although Meyer discerned the ties between Jung's turn to psychoenergetics and his own functional theories, Jung's departures from Freud's theoretical position raised the specter of renewed sectarianism in the field. Meyer was dismayed by the developing rift between Jung and Freud largely because he felt that such internal conflicts threatened to set back the cause of dynamic psychiatry. He hoped that the splitting of the psychoanalytic movement into rival camps would help open up discussion, but feared that instead the ensuing controversy would undermine the scientific consensus needed to establish public confidence in the field. In the face of the dispute between Jung and Freud, Meyer urged his American colleagues to respond in a constructive manner. "The European continent presents today a remarkable spectacle of sectarian condemnations," Meyer observed in connection with Jung's defection. He went on:

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[48] See Meyer's correspondence in 1912 with Abraham Arden Brill, Charles Macfie Campbell, August Hoch, Smith Ely Jelliffe, Hermann Meyer, James Jackson Putnam, and Edward Wheeler Scripture, concerning arrangements for Jung's New York stay and his visit to Johns Hopkins. According to Jung, he lectured in Baltimore in September, when he stayed with the analyst Trigant Burrow. See C. G. Jung, *Letters*, selected and edited by Gerhard Adler in collaboration with Aniela Jaffe, 2 vols. (Princeton: Princeton University Press, 1975), 1: 27. Laurie Lathrop has recently established that Jung subsequently visited Baltimore again on 24 October. See Laurie Lathrop, "What happened at St. Elizabeth's?" *Spring*, 1984, pp. 45–50. According to the evidence of the Meyer papers, Jung came to Baltimore at that time on Meyer's invitation.

[49] Jung, *The Theory of Psychoanalysis* (1912) in *Collected Works*, vol. 4, *Freud and Psychoanalysis*, trans. R. F. C. Hull (1961), pp. 85–226.

[50] James Jackson Putnam, "Presidential address before the American Psychopathological Association," *J. Abnorm. Psychol.*, 1913–14, *8*: 168–79, in which Putnam associates the ideas of both Jung and Bergson with the doctrine of spontaneous vital energy. Cf. Beatrice Hinkle, "Jung's libido theory and the Bergsonian philosophy," *New York Med. J.*, 1914, *99*: 1080–86; Nathan G. Hale Jr., *James Jackson Putnam and Psychoanalysis* (Cambridge, Mass.: Harvard University Press, 1971), Introduction.

[51] Meyer to Hermann Meyer, 2 December 1912; Meyer to Donald K. Henderson, 4 September 1912.

> I hope we shall get over the analogous phase of doctrinal vituperations more quickly in this country and use the press more for the helpful communications of the productive and creative and generally acceptable data than with [sic] the reiteration of condemnation of extreme generalizations, or of the absurdities of side products which will die the sooner the more systematically they are passed by. It certainly is the best way to deal with a "very cheap and weak affair"[52]

As these remarks help make clear, the developing conflict between Jung and Freud reinforced Meyer's belief in the superiority of American psychiatry, with its more collaborative spirit and pragmatic emphasis on common sense, problem solving, and practical results. "We shall not need any complete and uncompromising clash as is observed in Europe between the various camps," he predicted.[53] Meyer believed that the controversy in Europe presented American psychiatrists with the opportunity of proving that they did indeed have a body of positive data and scientific methods for obtaining them. He must have had his own methods in mind when he wrote in this regard:

> It seems to me a time when we ought to do all in our power to get together and to get a solid body of facts and principles which could stand together before the profession, putting more or less into the background the differences, of which to be sure there will be many, but I hope not so many that the profession and public need to be kept in the confusion in which they are at present.[54]

Meyer accused Jung and Freud precisely of being unable to put aside their differences in this way, just as he viewed the clash between them as further evidence of the sectarian, dogmatic character of European psychiatry

In this context Meyer's relations with Jung came to a close In April 1913, seven months after Jung's Fordham visit, the Phipps Psychiatric Clinic opened in Baltimore. In his remarks to the distinguished American and European guests assembled for the opening ceremonies, Meyer expressed his hope that the Clinic would come to stand as a monument to the broad, pragmatic trends of American psychiatry.[55] In August, he traveled to London to attend the Seventeenth International Congress of Medicine. There he gave a report on the Phipps Clinic and the following day witnessed a somewhat stormy discussion between Jung and others concerning the scientific validity of Freud's theories.[56] Three weeks later, the psychoanalysts gathered in Munich for their own International Congress, on which occasion the conflict between Jung and Freud became publicly manifest. It was known in advance that the dispute between the leaders of psychoanalysis had reached a breaking-point, and in a gesture that was resonant of his disapproval of the non-compromising attitude of his European colleagues, Meyer deliberately dropped the Munich meeting from his itinerary.[57] Personally and professionally, he wished to remain aloof from internecine struggles which seemed to him to bode no good for the cause of dynamic psychiatry His relations with Jung, begun so promisingly six years before, were at an end, and a new phase of intense methodological reflection along functional and pragmatic lines was under way.[58]

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[52] Meyer to Victor Haberman, 6 March 1914 See also Victor Haberman, "A criticism of psychoanalysis," *J Abnorm Psychol*, 1914–15, *9* 265–80

[53] Meyer to Morton Prince, 16 December 1915

[54] Meyer to Ernest Jones, 6 April 1914

[55] Meyer, "Opening of the Henry Phipps Psychiatric Clinic" (1913) in *Collected Papers*, 2 176–85 See also Meyer to William Osler, 29 August 1912 Meyer invited Ernest Jones to represent psychoanalysis at the opening ceremonies and Jones accepted Jung visited New York in March 1913 but it appears he did not see Meyer (*Freud/Jung Letters*, p 545)

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[56] Ellenberger, *Discovery of the Unconscious,* pp 817–19 Jung's paper at the meeting, "On Psychoanalysis" (1913), was first published under the title "Psychoanalysis and Neurosis" in 1916 See Jung, *Collected Works,* 4 243–51

[57] Meyer to Donald K. Henderson, 4 September 1913

[58] After 1913 Meyer's contacts with Jung virtually ceased He saw him at Harvard in 1936, when the two men were awarded honorary degrees, but failed to meet him on other occasions In later years, Meyer gave conflicting explanations for the loss of contact, attributing it variously to Jung's perception that Meyer disapproved of him, to a lack of interest on Jung's part, and to neglect on his side See Meyer to V H Podstata, 9 December 1931, Meyer to Maurice Leon, 27 October 1937, Staff Conference, 25 September 1939

HUNTING THE YELLOW FEVER GERM: THE PRINCIPLE AND PRACTICE OF ETIOLOGICAL PROOF IN LATE NINETEENTH-CENTURY AMERICA*

Margaret Warner

During the last two decades of the nineteenth century, the germ that caused yellow fever was discovered, debated, and abandoned more than a dozen times. From the late 1870s until the turn of the century, when Walter Reed and James Carroll verified the mosquito as the intermediate host in the transmission of an unidentified submicroscopic causative agent, the yellow fever germ was at the center of an animated international debate on the disease's etiology. Since yellow fever posed a vital threat to health and commerce in the United States and neighboring Caribbean islands, American medical investigators, including such men as Carroll, Frederick Novy, Reed, George Sternberg and William Welch, were to the fore having both a special incentive to establish yellow fever's etiology and an opportunity to study the disease where it thrived.

The germ theory was not itself at issue in the controversies surrounding the causative agent of yellow fever; by the 1880s virtually all participants agreed that some specific microbe caused the disease. The most prominent opponents of the various germs proposed as causing yellow fever during these two decades were not reactionaries who refused to accept the fundamental truths of bacteriology. Instead, the debates focused on the validity of the particular germs put forward, not on the germ theory itself. Such discoveries were judged according to two interlocking sets of criteria that stemmed from two different traditions: bacteriology and epidemiology. The principal field of battle lay within the bacteriological realm. Those entering the fray all agreed that a germ had to meet the rigorous standards of Robert Koch's rules of etiological verification in order to be accepted What was challenged in each case was the performance of the discoverer in putting into practice the methodological precepts to which all subscribed, and the consequent validity of the proof establishing that particular germ as *the* germ of yellow fever. In addition, a particular germ had to explain the facts about yellow fever as gathered through epidemiological field studies and clinical observation. This was probably the most important factor in convincing phy-

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Bull Hist Med, 1985, *59* 361–382

sicians without a background in bacteriology of the relevance of a particular germ to yellow fever. Analysis of the assumptions underlying the debates over yellow fever germs, and of the persistent sources of disagreement, displays the complexities and ambiguities that confronted bacteriological researchers and physicians in late nineteenth-century America: it also helps to clarify the medical significance of early bacteriology.

By the 1870s most American medical authors, especially those Southern writers who had personally witnessed the disease, held that the causative agent of yellow fever was a specific living germ of microscopic proportions. Even as early as the 1850s, the view that the cause of yellow fever, whatever its nature, was transportable had been widely accepted in the South, and two decades later this consensus had spread to Northern medical authors as well.[1] A few physicians still contended that yellow fever could arise spontaneously out of filth, the theory that the transportability doctrine had largely replaced in the mid-fifties. But for the most part American physicians were agreed that yellow fever developed from a transportable specific poison, not a concurrence of filth, heat, moisture or other non-specific factors. After a devastating yellow fever epidemic swept through the South in 1878, afflicting nearly one hundred cities and towns, it appeared clear that the cause of yellow fever could travel along transportation routes. The germ theory of yellow fever provided the most convincing explanation of this behavior, and the events of 1878 clearly heightened the theory's prestige[2]

The maturation of the germ theory of yellow fever in the 1870s evolved not so much from the discovery of new information about yellow fever but from the evidence accumulated by medical investigators about other diseases. Supporters of such a theory in the 1850s had asserted that this was the only explanation of the epidemiology of yellow fever that made sense, especially given the ability of the disease to develop into a wide scale epidemic after the introduction of only one source. In their view, such proliferation indicated the rapid reproduction of some living thing. Germ theorists in the 1870s and 1880s were forced to rely on similar arguments, but they could point in addition to the demonstration of microbial causes for other diseases and proclaim that it was only a matter of time before the agent of yellow fever would likewise be found. The recurring discoveries of yellow fever germs in the 1880s and 1890s bolstered this faith.[3]

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[1] Margaret Warner, "Public Health in the Old South," in Ronald L Numbers and Todd L Savitt, eds , *Science and Medicine in the Old South,* forthcoming

[2] Margaret Warner, "Local control versus national interest the debate over southern public health, 1878–1884," *J South Hist*, 1984, *50* 407–28 The widespread acceptance of the germ theory of yellow fever is evident in the majority of articles on yellow fever from the 1870s onward See, for example, Henry D Schmidt, "On the pathology of yellow fever, with some remarks on its cause, and the means for its prevention," *New York Med J*, 1879, *29* 113–56, and Henry F Campbell, "The Yellow Fever Germ [delivered before the Medical Association of Georgia, April, 1879]," in William Henry Goodrich, ed , *The History of the Medical Department of the University of Georgia* (Augusta, Ga n p , [ca. 1928]), pp 60–76 By 1880, the faculty of the University of Lousiana Medical School (later part of Tulane University) was solidly in favor of the germ theory of yellow fever, and taught it to their students (Rudolph Matas, "Discussion of the etiology and pathology of yellow fever," *New Orleans Med Surg J*, 1897–98, *50* 211–13)

The acceptance of the germ theory of yellow fever in the United States in the last quarter of the nineteenth century is evident in its widespread application in public health efforts. Public health measures against yellow fever concentrated on excluding, starving, or the outright killing of the yellow fever germ. Public health workers employed disinfectants to destroy the germ on clothing, bedding, walls, floors, streets, ships, and in privies. In using disinfectants they were not attempting merely to neutralize potentially pathogenic "bad smells," as some of their predecessors in other areas of public health work had done; their explicit target was the germ itself. Although physicians often questioned the value of particular disinfectants, and researchers sought to discover the most potent germicide that was at the same time safe and practical, by and large the efficacy of disinfectants in the prevention of yellow fever was unquestioned. Disinfectants were central to the new quarantine procedures, which, although conceived before the Civil War, were fully implemented only in the 1880s. The new system, termed revolutionary by its foremost proselytizer, Joseph Holt of the Louisiana State Board of Health, involved the cleansing of ships which had arrived from yellow fever ports and their subsequent purification with disinfectant substances. The contents of the ship, including personal items carried by passengers, were disinfected as well. In this procedure the assumption of a germ target was central.[4]

The concept of the germ was an amorphous one in the 1870s. Although medical men could agree on the evidence for its existence, they were not in accord as to its exact nature. The young George Sternberg in 1875 typically stipulated that the essential requirement for the "*contagium vivum*" was that it "*is capable of self-multiplication independently of the human body*"[5] Naturally, such a creature had to be microscopic, as well, to qualify for germ status The biological order thought most likely to contain the germ of yellow fever during the 1870s was the fungi, since the preference of this group of creatures for warm, moist climates accorded well with the distribution of yellow fever. During the 1880s and 1890s, as microbiologists discovered more and more bacterial causes for other diseases, the bacteria replaced the fungi as the most likely affiliation of the yellow fever microbe

[3] See, for example, Harvey E Brown, *Report on Quarantine on the Southern and Gulf Coasts of the United States* (New York William Wood, 1873), pp 85–87, and George M Sternberg, *Report on the Etiology and Prevention of Yellow Fever* (Washington, D C Government Printing Office, 1890), p 13

[4] One of the best and most detailed accounts of the employment of germicidal techniques against yellow fever is George M Sternberg et al , *Disinfection and Disinfectants Their Application and Use in the Prevention and Treatment of Disease, and in Public and Private Sanitation* (Concord, New Hampshire Republican Press Association for the American Public Health Association, 1888)

[5] George M Sternberg, "An inquiry into the modus operandi of the yellow fever poison," *New Orleans Med Surg J*, 1875–76, *3* 7

Any germ proposed had to conform to several accepted criteria. Physicians initially embraced a germ theory of yellow fever largely because it proved so useful in explaining the epidemiology of the disease, especially its transportability. A microorganism identified by a researcher as the specific causative agent in yellow fever was plausible to the extent that it preserved this explanatory power. There were many puzzling facts about yellow fever that physicians hoped the discovery of the yellow fever germ would clarify. Contemporaries held it to be an established fact that the yellow fever germ traveled in material objects, such as the holds of ships, cargoes, and baggage,[6] although the issue of whether yellow fever was contagious from person to person remained cloudy through the end of the century. Most public health officials acted as if they assumed diseased persons were dangerous to those around them. Whether the peril arose from their individual contagiousness or their personal effects, isolation of yellow fever patients and the disinfection of any material objects accompanying them were standard public health procedures during the last two decades of the nineteenth century. Any germ theorist who could explain the exact role of the patient in the transmission of yellow fever and the ability of the germ to thrive in an environment exterior to the patient through the elaboration of his germ's life cycle or behavior had excellent evidence to offer in the verification of his discovery.

Another prerequisite for any proposed germ was that it could be airborne. The wafting of the yellow fever germ through the air accounted for the disease's ability to jump from house to house in the absence of communication between the occupants, and also made understandable the outbreak of an epidemic at several points in a city simultaneously. An adjunct to this idea was the assumption that air particularly heavy with unhealthy vapors, such as the emanations from garbage heaps or mounds of putrefying filth, provided the most hospitable environment for the germ. The germ could not survive, many public health practitioners argued, in a clean atmosphere. Explaining the supportive qualities of dirty air was another task for the proponent of a neophyte yellow fever germ.[7]

The most significant characteristic of yellow fever with which any proposed germ had to be consistent was the disease's well marked geographic selectivity. The existence of a yellow fever zone was undisputed, however much physicians might wrangle over its boundaries. The disease clearly preferred hot, humid and filthy locations. Any microorganism proposed as the culprit for yellow fever which was not subject to damage by extremes of cold, or which was widely prevalent outside of the yellow fever zone, was not likely to achieve medical acceptance[8]

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[6] C B. White, "To the editor of the *New Orleans Medical and Surgical Journal*," *New Orleans Med Surg J*, 1875–76, *3* 445

[7] These assumptions are common in the literature concerning yellow fever See, for example, Richard B Maury, "Yellow fever," *Memphis Med Monthly*, 1898, *18* 1–8, J C LeHardv, "The yellow fever panic," *Atlanta Med Surg J*, 1888–89, *5* 605–16, and J M. Clemens, "Etiology of yellow fever," *Louisville Med News*, 1878, *6* 134–38

The yellow fever authorities who had been studying the disease in the South since the early years of the century were natural historians, whose technique consisted in closely observing the disease, carefully noting its apparent origin, symptoms, response to therapy, association with temperature, humidity and filth, and duration in individuals and the community. Medical researchers studied and described yellow fever in much the same way that biologists characterized an animal species through field research To prove a new theory about yellow fever within the natural history framework, a researcher rarely relied on tests or experiments, instead, he or she was constrained to demonstrate the ways in which the new idea more powerfully explained the natural history of yellow fever without contradicting accepted knowledge about the disease. The study of yellow fever in the laboratory during the 1870s and 1880s provided an alternative to this older approach, but did not replace it Consequently, when a germ of yellow fever was proposed during the late nineteenth century, it not only had to meet the requirements of laboratory science for establishing its validity, but also the experience of the natural historian of yellow fever.[9]

The remarkable discoveries of the bacteriological laboratories of Europe were well known to American physicians of the 1880s and have been extensively documented by historians. For every major success, such as Koch's establishment of the tubercle and anthrax bacilli or Klebs's and Loeffler's work on diphtheria, there were a multitude of research efforts that did not yield the correct causative agent. The frequent announcement and then retraction of microorganismic etiological breakthroughs created skepticism about the claims of bacteriologists. In an address before the New York Academy of Medicine in 1884, its president, Abraham Jacobi, lamented the "bacteriomania" that had swept the medical profession While praising the careful research and conservative attitude of "Robert Koch and his peers," Jacobi feared that too often Koch's followers were given to sloppy technique and overenthusiasm for their own discoveries. American physicians, he thought, were too quick to believe every announcement "The practitioners, either general or special, have readily accepted the new gospel with but few exceptions," Jacobi reported. "The new theories that infectious and zymotic diseases have each their own bacillus, are so pleasant and promised to be so fruitful that it required some courage to critically resist the flood."[10]

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[8] George M. Sternberg, "The history and geographical distribution of yellow fever," *Janus*, 1896–97, *1* 195–201

[9] The most useful histories of microbiology are William Bulloch, *The History of Bacteriology* (London Oxford University Press, 1938), and Hubert A. Lechevalier and Morris Solotorovskv, *Three Centuries of Microbiology* (1965, New York Dover Publications, 1974)

[10] Abraham Jacobi, "Inaugural address, delivered before the New York Academy of Medicine," *Med Rec*, 1885, *27* 172–73

Robert Koch himself had recognized the possibility that careless bacteriological technique could lead to the promotion of pseudo-discoveries He had established the procedures which formed the basis of bacteriological research, and no one realized more clearly than their originator that the process was open to error and impediment at every point. In an article published in 1881 Koch described his method of determining whether a microorganism caused a particular disease The microbe had to be 1) discovered in the diseased animal; 2) isolated in a pure culture; 3) inoculated into a healthy animal; and then 4) recovered after the animal had developed the disease in question. The procedure dictated by these recommendations, which came to be known as Koch's postulates, set the standard for bacteriological research and demonstration. Throughout this and later essays, Koch emphasized the need for care and constant vigilance, so that the researcher's verification of the specific association of a germ with a disease was not impeded by contaminating irrelevant organisms or other confusing factors.[11]

Few American physicians would have had the opportunity to absorb Koch's cautions, however. They were more likely to learn of his work through brief abstracts than by reading the original German.[12] Certainly some American physicians, notably George Sternberg, Theobald Smith, and Abraham Jacobi, were competent to study and absorb the total impact of Koch's teachings, but other American practitioners, unschooled in German or in microscopical technique, quite understandably lacked the critical faculties for evaluating newly proposed disease germs. This did not bar them from the excitement of bacteriology and from recognizing the power of the germ theory to explain infectious diseases and offer new solutions to the problems of diagnosis, therapeutics and prophylaxis.[13]

The search for the yellow fever germ offered a particularly enticing goal for medical researchers. The medical profession in America, and especially in the South, had been repeatedly condemned for its inability to explain, treat, or control yellow fever. This impotence was embarrassing for the profession.[14] The proof that a germ was the cause of yellow fever, and the discovery of that germ itself, with all the opportunities for the control of the disease that such a discovery would generate, were some of the most sought after goals of late nineteenth-century bacteriology. As one physician practicing in the period reminisced, "It was not long before many anxious explorers began to see the coveted prize."[15]

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[11] Robert Koch, "Zur Untersuchen von pathogenen Organismen," trans Victor Horsley as "On the Investigation of Pathogenic Organisms," in W Watson Chevne, ed, *Recent Essays by Various Authors on Bacteria in Relation to Disease* (London New Svdenham Societv, 1886), pp 3–64 The quotation is on p 35

[12] Brief accounts of Koch's ideas were soon available to American physicians in, for example, "A Supplementary Account of the Researches of Koch and Others," appendix to Austin Flint, *A Treatise on the Principles and Practice of Medicine*, 5th ed (Philadelphia Henrv C Lea's Son, 1884), and Daniel E Salmon and Theobald Smith, "Koch's method of isolating and cultivating bacteria as used in the laboratory of the Bureau of Animal Industry, Dept Agriculture," *Amer Month Microscop J*, 1885, *6* 81–84 By 1886, an English language bacteriology textbook (Edgar M Crookshank [Demonstrator of Physiologv, King's College, London], *An Introduction to Practical Bacteriology Based upon the Methods of Koch* [New York J H Vail, 1886]) had been published, although its dissemination among and influence upon American physicians is difficult to calculate

[13] Theodore S Bell, "What is yellow fever?" *Louisville Med News*, 1878, *6* 85

[14] Matas, "Discussion," p 219.

The germ of yellow fever could not be studied to any great extent in the laboratories of Europe, because the disease occurred rarely on that continent in the nineteenth century. Although preserved cultures of microorganisms could be and were shipped to the Pasteur Institute in Paris, for example, the germ had to originate from the body of a yellow fever patient, a commodity available only in a few localities and at circumscribed times of the year. This limitation accounts for the near monopoly which Southern physicians maintained in the field of yellow fever research in America from the 1850s, and also explains the declining numbers of American yellow fever studies in the last decades of the nineteenth century, when yellow fever appeared in substantial epidemics in the United States only at approximately ten-year intervals. Thus yellow fever investigators of the last quarter of the nineteenth century by necessity largely pursued their studies outside the United States, in Cuba, Mexico, South America, or Africa.

During the 1870s American physicians made their first attempts to locate the yellow fever germ by examining the blood and tissues of fever victims. The Louisiana physician Joseph Jones searched for animalcules in the discharges of his yellow fever patients, and then did detailed post-mortem examinations from which he amassed voluminous information about the effect of the disease on the body, but he made no progress in finding yellow fever's cause.[16] To the Philadelphia physician Joseph Richardson went the dubious honor of being the first to announce the discovery of a yellow fever germ; his work was quickly discredited by another physician more familiar with post-mortem bacterial invasion of yellow fever cadavers[17]

The most impressive early microscopic research on yellow fever was performed by George Sternberg in 1879 The Congress sent a commission to study yellow fever in Cuba that year under the auspices of the National Board of Health, and Sternberg was the commission's microscopist. He stained, examined, and photographed blood specimens from over one hundred yellow fever patients, but failed to visualize the yellow fever germ.[18] In a private, unpublished report to his superiors, Sternberg suggested that a certain species of penicillium which had appeared frequently might be the causative agent, but his later work apparently caused him to reject it as a possibility.[19] Sternberg was very conscious of the folly of announcing pseudo-discoveries, and earned a reputation for neither accepting another's work incautiously, nor of rushing to publish his own speculations. Sternberg had gone to Cuba thinking that the germ would be found with little trouble, but the evidence of his photographs led him and many other bacteriologists to conclude that if the yellow fever germ were visible in the blood, his photographs should have revealed it.[20]

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[15] Joseph Jones, "Contributions to the natural history of yellow fever constitution and changes of the blood in yellow fever," *New Orleans Med Surg J*, 1874–75, *2* 177–206, was one product of Jones's research The Joseph Jones Papers (Department of Archives and Manuscripts, Library, Louisiana State University, Baton Rouge, La.) contain numerous notebooks and manuscript studies resulting from his yellow fever investigations

[16] Matas, "Discussion," p 219

[17] "Supplement to the National Board of Health *Bulletin* Preliminary Report of the Havana Yellow-Fever Commission of the National Board of Health," submitted 18 November 1879 by Stanford E Chaillé, chairman, and George M Sternberg, secretary

[18] George Sternberg, "Special Report to Nat Bd of Health," December 1881, Letters Received by the National Board of Health, 1879–1884, National Archives Microfilm #753, Reel 33 This collection of manuscripts now exists only on microfilm

In the following decade bacteriologists with access to yellow fever patients proposed a bevy of candidates for the germ of yellow fever. One New Orleans physician, who himself had gone to Cuba with the National Board's commission, described the early years of the 1880s in a discussion of yellow fever's etiology written just before Reed's investigations.

> We find that after the negative researches, of Woodward, Sternberg and Schmidt in 1879 and 1880, no discovery was definitely announced until 1881, when Charrin and Capitan believed that they had found a specific micrococcus in specimens of blood brought to Paris by Morand, from Senegal In 1883, Dr Lacerda, of Rio de Janeiro, having discovered what he believed to be the specific micro-organisms in the liver and kidneys of yellow fever patients, sent some material to Paris to Dr. Babes. For a time Babes believed that they were the veritable germs of yellow fever, but he subsequently renounced this claim.[21]

A Panamanian, L. Gerard, also believed that he had isolated the microbe, while a Brazilian named Da Gama Lobo made similar claims. Yet these discoveries attracted only passing mention in American medical journals.[22]

The first yellow fever germ to earn widespread attention from American physicians was that announced in 1885 by Domingos Freire, president of the Central Board of Health of Rio de Janeiro, a city that had been afflicted by yellow fever since mid-century In his lengthy book Freire described the microbe of yellow fever, an alga he denominated as *cryptococcus xanthogenicus,* which he had located in the blood, urine, and dejecta of yellow fever patients. The germ began its simple life cycle as a spore, which then grew until it burst, releasing new spores, a yellow pigment, and black ptomaines. According to Freire, the yellow pigment diffused throughout the patient's body, producing the jaundiced appearance typical of the disease, the black ptomaines both poisoned the system and gave color to the black vomit Freire inoculated his microbe, first isolated from yellow fever patients, into guinea pigs and rabbits, producing what he described as the characteristic lesions of yellow fever.

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[19] Biographies of Sternberg are Martha Sternberg, *George Miller Sternberg A Biography* (Chicago American Medical Association, 1920), and John M Gibson, *Soldier in White The Life of General George Miller Sternberg* (Durham, N.C Duke University Press, 1958)

[20] Matas, "Discussion," p 220.

[21] "The land origin of the yellow fever," *Mississippi Valley Med Month*, 1881, *1.* 325, L Gerard, "Report on the etiology, and the preventive vaccination of yellow fever," trans Wolfred Nelson, in *Canada Med Rec*, 1885–86, *14* 577–79

[22] Domingos Freire, *La doctrine microbienne de la fièvre jaune et ses inoculations préventives* (Rio de Janeiro Imprimerie Nationale, 1885)

A student and self-professed disciple of Pasteur, Freire then proceeded to develop a yellow fever vaccine. He attenuated the microbe by repeatedly recovering the germ from inoculated animals, culturing it, and then inoculating the germ into a new host, all during winter, when yellow fever in Brazil had low malignancy. Freire inoculated the resulting, supposedly weakened micrococcus into hundreds of persons, and claimed great success in preventing or ameliorating yellow fever. Freire also offered a new explanation of the means by which a place became infected with yellow fever: he found an abundance of spores in the dirt covering yellow fever graves. He reported that the grave cultures produced symptoms in laboratory animals similar to those generated by the spores that came directly from yellow fever patients [23]

Reports in American newspapers ignited public excitement about Freire's work. A purportedly similar discovery by a Mexican researcher, Manuel Carmona y Valle, added to the growing belief that the cause of yellow fever had been found. A group of prominent sanitarians, including John Shaw Billings, John Hamilton, George Sternberg and Joseph L. Toner, and also a resolution passed by the American Public Health Association, urged the Congress to send a commission to Mexico and Brazil to study the reported microbes. The Association sent Joseph Holt to lobby in Washington for Congressional action. The drive for a separate piece of commission legislation failed, but the Congress did include funding for a yellow fever investigation in a civil appropriations bill for the year ending 30 June 1888. President Grover Cleveland chose George Sternberg for the mission, an appointment which drew widespread approbation. Sternberg was to travel to Brazil and Mexico to study the work of Freire and Carmona y Valle. Later appointments sent him to Havana, and, during the yellow fever epidemic there in 1888, to Decatur, Alabama.[24]

Skepticism about Freire's work appeared in the medical press even before Sternberg had left the country Two British bacteriologists attempted to duplicate Freire's yellow fever grave cultures but failed to find his microbe, although they did discover a large variety of bacteria bearing no relation to yellow fever that produced mock yellow fever symptoms in guinea pigs.

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[23] *Ibid* For the assertion about graveyard soil, Freire could cite the analogous case of anthrax, a disease for which infective spores had recently been discovered in the soil over the graves of animals dead of the disease

[24] Manuel Carmona y Valle, *Leçons sur l'étiologie et la prophylaxie de la fièvre jaune* (Mexico City Imprimerie du Ministère des Travaux Publics, 1885) A series of articles appeared in the *New Orleans Medical and Surgical Journal* about Freire's work and the yellow fever commission "Freire's yellow fever microbe," 1885–86, *13* 547–51, "The yellow fever commission," 1885–86, *13* 623–25, "Carmona's yellow fever inoculations," 1885–86, *13* 626–29, "The yellow fever commission," 1885–86, *13* 629–32, "The yellow fever commission," 1885–86, *13* 722–28, "The yellow-fever commission," 1885–86, *13* 964–72, "The yellow fever commission," 1885–86, *13* 990–94, "The president's power in the prevention of epidemics and the yellow fever commission," 1886–87, *14* 140–42, "Yellow fever inoculation," 1886–87, *14* 623–24, "Carmona and Freire once again," 1887–88, *15* 894–95

They concluded that the experimental animals were suffering from some form of septicemia, not yellow fever at all.[25] The editors of the *New Orleans Medical and Surgical Journal,* who tended to maintain a critical attitude toward discoveries of germs, ridiculed Freire's "cryptocockeye" and found its discoverer "lacking in sufficient pathological and microscopical experience and in a thorough knowledge of microbiology."[26] His microbial classification was archaic, and his comments on the nature of the black vomit ridiculous. The *Journal's* editors were strident in their opposition to the yellow fever commission supported by Holt, for they found the germs of Freire and Carmona "so utterly devoid of all scientific value, that we regard it as both foolish and extravagant to expend upon their investigation one single cent of money."[27]

Sternberg's report on Freire, Carmona y Valle, and other yellow fever research fully sustained the skeptics. "The specific infectious agent of yellow fever has not been demonstrated," Sternberg bluntly concluded. "The most approved bacteriological methods fail to demonstrate the constant presence of any particular microorganism in the blood and tissues of yellow-fever cadavers."[28] Neither Freire nor Carmona y Valle had succeeded in isolating the germ of yellow fever; nor were their human inoculation methods valid. Sternberg devoted much of his research to Freire's work, which had been the most touted in American medical circles He found flaws in nearly every aspect of Freire's method Since he had failed to find Freire's supposedly highly visible microbe, "the inference seems unavoidable that in his research [Freire] has mistaken broken-up blood corpuscles and the granular *débris* of the tissue elements for microorganisms," Sternberg asserted.[29] Freire's errors had also possibly resulted from his practice of drawing blood specimens from the fingers of yellow fever patients, for their skin was undoubtedly contaminated with myriad bacterial species. The cultures grown from such specimens had no relevance to yellow fever. Sternberg ridiculed the black pigment production hypothesis as well, for nothing was more certain, he declared, than the hemorrhagic origin of the black vomit.[30]

After soundly refuting Freire's claim to have discovered the causative agent of yellow fever, Sternberg went on to demonstrate the inefficacy of Freire's inoculations. Sternberg did not rule out the possibility that Freire's human inoculations might be prophylactic even if his micrococcus did not cause yellow fever But upon examination he found Freire's statistical arguments poorly substantiated and weak in logic. According to Sternberg, Freire's fundamental error lay in his estimates of the number of deaths that would have occurred from yellow fever if no inoculations had been given. Freire used figures based on an 1881 Senegal epidemic to project the counterfactual mortality rate among those he inoculated in Rio de Janeiro during the year of his inoculation test He then compared the number of actual yellow fever deaths with the expected value, and deduced that his vaccine had greatly diminished mortality. Sternberg found this line of reasoning fallacious, and argued that the two epidemics, cities, and populations were too different to justify comparison. He further criticized Freire for including in his inoculation group persons unlikely to be fatally afflicted by yellow fever, such as natives of the city and blacks, this procedure ensured that the mortality rate among inoculated persons would be low whatever the vaccine's effects.[31]

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[25] J H Sutton and J B Harrison, "The micro-organisms of yellow fever," *Lancet,* 1885, *1* 405–6

[26] "President's power," p 140, and "Freire's yellow fever microbe," p 548

[27] "Yellow fever commission," p 629

[28] Sternberg, *Report on Yellow Fever,* p 221

[29] George M Sternberg, "Investigations relating to the etiology and prophylaxis of yellow fever," *Med News,* 1888, *52* 451 Sternberg quoted extensively from this paper in his report

[30] *Ibid*, p 452

After Sternberg's 1890 report, little more was heard of Freire, and even less of Carmona y Valle Its publication closed an era of research on the yellow fever germ. Sternberg had exhaustively studied and disposed of every germ proposed during the previous decades, leaving the only contender in the field his own *bacillus x*, a microorganism that had turned up occasionally in his Cuban investigations. Sternberg postulated that the microbe which caused yellow fever was anaerobic and extremely choosy about the culture medium in which it would grow, traits which made its study by bacteriologists difficult, and noted that his *bacillus x* was such an organism. But his findings on the bacillus were far too tentative, in his judgment, to warrant any decision about its role in yellow fever. Reflecting his own frustration with the search for the yellow fever germ, Sternberg listed the difficulties that hounded yellow fever researchers rapid degeneration of yellow fever cadavers, likelihood of secondary bacterial infestation near or after death, and the debris found in the blood stream of a body whose functions were breaking down. Any of these factors could lead the researcher to target as a germ some microscopic object incidental to the disease.[32]

Still, Sternberg held out great hope that the yellow fever germ would yet be discovered. "My faith in a living infectious agent as the specific cause of this disease is by no means diminished by my failure thus far to demonstrate the exact form and nature of this 'hypothetical germ,' " Sternberg reiterated in the introduction to his 1890 report. "The present state of knowledge with reference to the etiology of infectious diseases in general and well known facts relating to the origin and spread of yellow-fever epidemics fully justify such a belief."[33] The pressures of his appointment as Surgeon General of the Army in 1893, and the absence of yellow fever from American soil until the late 1890s, combined to prevent him from ever again personally pursuing the elusive yellow fever germ.

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[31] George Sternberg, "Dr Freire's protective inoculation—facts versus figures," *Med Rec*, 1890, *37* 524–26, *idem*, "Facts versus figures yellow fever inoculation," *JAMA*, 1890, *15* 142–44

[32] Sternberg, *Report on Yellow Fever*

[33] *Ibid*, p 13

The Freire-Sternberg controversy illuminates certain problems of verification shared by bacteriologists seeking the yellow fever germ. Most bacteriologists accepted the dicta laid down by Robert Koch for determining that a particular germ was causally related to a particular disease. As was the case for many other diseases, this program was extremely difficult to execute in the investigation of yellow fever If the criteria of diagnosis for humans were ambiguous, there was even less consensus on the diagnosis of yellow fever in rabbits and guinea pigs. The dispute over whether Freire had produced true yellow fever or merely a form of septicemia in his laboratory animals was merely the earliest prominent instance of a problem which was to plague bacteriologists studying yellow fever for the next quarter century.[34] The problem of specimens contaminated by normal flora or secondary invaders further complicated the isolation of an organism specific to the disease in question. The debate over the accuracy of Freire's work also demonstrated the problems inherent in establishing the effectiveness of a prophylactic technique through the agency of statistics. How could the efficacy of a vaccine be verified for a disease as complex as yellow fever? To prove that the person inoculated was not immune to yellow fever and to establish that he or she would have contracted the disease in the absence of the inoculation were impossible tasks. The only available tool for assessing vaccine efficacy was statistical analysis, and although Freire's particular statistical methods were faulty, his overall decision to rely on statistical verification represented a sophisticated approach to the research problem at hand

No announcement of a newly discovered yellow fever germ appeared for seven years after the publication of Sternberg's report of 1890. This hiatus was largely due to the impact of his report, for so thorough had Sternberg's researches been in Havana, Rio de Janeiro, Vera Cruz, and Alabama, and so severe his refutation of Freire et al, that a sober conservatism prevailed in yellow fever etiology during the 1890s.[35] The disease itself contributed to this lull, by occurring less frequently worldwide. But during the last half of the decade yellow fever again returned to a number of localities, sparking the curiosity of bacteriological researchers

In 1897 two bacteriologists, Giuseppe Sanarelli, director of the Institute for Hygiene in Montevideo, and Wolff Havelburg of Rio de Janeiro published independent accounts of a yellow fever germ.[36] Havelburg's microbe was short-lived in public esteem, but Sanarelli's announcement aroused great excitement throughout the medical world. Sanarelli, a distinguished Italian bacteriologist trained in Rome, Paris, and Berlin, had at the request of the Uruguayan government instituted a study of the yellow fever prevailing at Montevideo in 1896. His revelations resulted from that work. "The discovery being announced by such a savant and through the columns of the *Annals of the Pasteur Institute of Paris,* it caused a profound sensation,"recalled Aristides Agramonte of the Reed commission. "The work was published in several languages and in a comparatively short period the scientific world tacitly accepted the claims of Sanarelli."[37] Of Sanarelli's work Walter Reed commented in 1902, "No more important achievement in scientific investigation had been claimed since Koch's announcement in 1882 of the discovery of the bacillus of tuberculosis."[38]

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[34] Koch himself had trouble indisputably diagnosing disease in animals In his famous paper on the etiology of tuberculosis published in 1884, he explained that "nothing is simpler than to exclude this source of fallacy [the confusion of non-tubercular nodules with truly tubercular ones] The true tubercules are infective, and contain tubercle-bacilli, with non-tubercular nodules this is not the case" But in the demonstration that tubercle bacilli cause tuberculosis, this assumption came before the conclusion that the bacilli were the sole infective agents of tuberculosis He assumed what was to be proven, if animals develop lesions containing tubercle bacilli, then the animal has tuberculosis and the bacilli have been proven to cause tuberculosis ("The Etiology of Tuberculosis," trans Stanley Boyd in Cheyne, ed, *Recent Essays*, p 155)

[35] Eugene Wasdin, no particular friend of Sternberg, credited his report with this stultifying influence in "Yellow fever its nature and cause," *JAMA*, 1900, *35* 869

Eugene Wasdin of the Marine Hospital Service remembered another aspect of the response to Sanarelli, the "murmur of surprise and incredulity" that initially arose over Sanarelli's theories, which grew out of the conviction that Sternberg's work had conclusively shown that the yellow fever germ could not be found in the blood.[39] Sanarelli's germ became a cause célèbre, the microbe of the hour, and the center of a lively controversy. "The foremost question agitating the professional mind to-day is that of yellow fever, and more especially its etiology," began an 1897 Georgia medical journal article entitled, aptly enough, "Sternberg vs. Sanarelli."[40]

Sanarelli labeled his microbe *bacillus icteroides* and claimed to have found it in 58 percent of the yellow fever patients and cadavers which he had examined. According to Sanarelli, his bacillus, like the bacilli of tetanus and diphtheria, acted by releasing a toxin that poisoned the body. It was the toxin, not the bacillus itself, which produced steatosis in the liver, violent black vomit and the typical congestive and hemorrhagic symptoms of the disease. Consciously following Koch's postulates, Sanarelli isolated the bacillus from the fluids and tissues of yellow fever cadavers, cultured it on a variety of media, injected it into hundreds of laboratory animals, and then diagnosed clinical yellow fever. Sanarelli also injected a feeble solution of his bacillus into human subjects, producing, he declared, characteristic yellow fever. The bacillus further demonstrated its identity as the yellow fever germ by agglutinating the blood serum of yellow fever patients, thereby proving, to Sanarelli at least, that it matched specifically the antibodies generated by yellow fever victims against the disease's causative agent. Sanarelli attenuated the bacillus by inoculating successively weaker cultures into a series of horses in order to create an anti-amarylic serum, which he hoped would prove useful both as a treatment and as a prophylactic tool.[41]

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[36] Wolff Havelburg, "Experimentalle und anatomische Untersuchungen uber des Wesen und die Ursachen des gelben Fiebers," *Berliner Klinische Wochenschrift,* 1897, *34* 493–96, 526–28, 542–44, 564–67 Sanarelli's original paper is "Étiologie et pathogénie de la fièvre jaune," *Annales de l'Institut Pasteur,* 1897, *11* 433–514, 673–98, 753–66

[37] Aristides Agramonte, "Report of bacteriological investigations upon yellow fever," *Med News,* 1900, *76* 204

[38] Walter Reed, "Yellow fever," typescript of an address delivered to the Michigan Academy of Science, 1902, Walter Reed Papers, National Library of Medicine, Bethesda, Maryland.

[39] Wasdin, "Yellow fever," p 869

[40] R S W, "Sternberg vs Sanarelli," *Georgia J Med Surg,* 1897, *1* 236–37

George Sternberg greeted Sanarelli's discovery with very guarded optimism. His first response was to claim that if Sanarelli's germ bore any relation at all to yellow fever, it was in all likelihood identical to his *bacillus x.* Sternberg had a penchant for asserting his primacy in the race to tease out the etiology of yellow fever, he was to exhibit this tendency later in jealously claiming credit for his role in Reed's discoveries. Surgeon General Sternberg ordered physicians working at the Army Medical Museum in Washington to investigate Sanarelli's bacillus, and especially to test for its identity with his own microbe. In their first assignment on yellow fever, Walter Reed and James Carroll challenged Sanarelli's theories, and showed the distinctiveness of *bacillus icteroides* from *bacillus x.* In 1898, Sternberg sent Aristides Agramonte, a Cuban physician and United States Army contract surgeon who worked in Reed's laboratory in Washington, to study the bacilli in Cuba. On the basis of his researches Agramonte likewise condemned Sanarelli's work. The third major critic of Sanarelli was Frederick Novy, a young American physician working at the Pasteur Institute in Paris who was asked by the prominent French bacteriologist Emile Roux to ascertain whether the Sanarelli and Havelburg bacilli were in fact the same organism. Novy conclusively demonstrated their non-identity, and then went on to deny Sanarelli's title as the discoverer of the cause of yellow fever.[42]

Prominent in the controversy dividing Sanarelli and his opponents were ad hominem arguments. Sanarelli smugly pitied Sternberg for his "fruitless researches" and accused him of spiteful jealousy. "I cannot understand," said Sanarelli of Sternberg's criticisms, "his obstinate unwillingness to concede that another has succeeded in solving the problem which proved unsolvable to him."[43] Sanarelli dismissed Reed and Carroll as "two young bacteriologists" (Sanarelli was Reed's junior by ten years) with "unfortunate deference" to their superior, Sternberg.[44] Novy, whom Sanarelli could not include in this vendetta, was accused instead of having "a mind absolutely guiltless of even elementary knowledge of epidemiology"[45] Perhaps not entirely disingenously, Sternberg, Reed, Carroll and Novy all publicly regretted that Sanarelli had adopted such an unprofessional tone and disavowed any personal feeling on their own part. Still Reed and Carroll could not resist remarking that "Sanarelli displays profound ignorance of the pathology of coagulation necrosis."[46] In his second contribution to a particularly heated exchange, Sanarelli sulkily declared himself "of the conviction that the whole discussion is a miserable waste of time, and can have no definite scientific importance."[47] Sternberg disagreed.

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[41] Sanarelli, "Étiologie et pathogénie", the quotation is on p 462

[42] Frederick G Novy, "The etiology of yellow fever," *Med News,* 1898, *73* 326–31, 360–69, George M Sternberg, "The bacillus icteroides of Sanarelli (bacillus *x*—Sternberg)," *Amer J Med. Sci ,* 1897, *114* 305–23, Walter Reed and James Carroll, "Bacillus icteroides and bacillus cholerae suis—a preliminary note," *Med News,* 1899, *74* 513–14, Agramonte, "Bacteriological investigations"

[43] Giuseppe Sanarelli, "Some observations and controversial remarks on the specific cause of yellow fever," *Med News,* 1899, *75* 193

[44] Giuseppe Sanarelli, "The bacteriology of yellow fever once more," *Med News,* 1899, *75* 741

[45] Sanarelli, "Some observations," p 196

The controversy over Sanarelli's bacillus illustrates far better than the Freire-Sternberg dispute the uncertainties inherent in bacteriological verification in the late nineteenth century. Sanarelli was a competent bacteriologist, his evidence was impressive, and his work was judged accurate by many investigators. Particularly influential was the 1899 report submitted by Eugene Wasdin and Henry Downes Geddings of the Marine Hospital Service acknowledging the validity of Sanarelli's discovery. Working side by side with Agramonte in Havana, often drawing specimens from the same yellow fever patients and cadavers, Wasdin and Geddings successfully isolated and cultured the *bacillus icteroides* in many cases in which Agramonte failed to do so. The Marine Hospital Service researchers began their report in praise of Sanarelli's work with the contention that it had met all the requirements of Koch's postulates.[48] The Sanarelli controversy demonstrates that the ideal guidelines established by Koch were open to error and disputation at practically every point. The debate over the *bacillus icteroides* was structured within the regimen Koch prescribed, both sides accepted this procedure as the appropriate method for testing the specificity of the germ for yellow fever Where they differed was in the interpretation of the results obtained. Performance, not principle, was in question.

The preliminary step in Koch's ideal etiological demonstration was isolating the microbe under consideration from the bodies of persons sick with the disease in question This was done either by viewing it microscopically in stained tissues or fluids (a difficult achievement in many diseases), or growing pure cultures of it from specimens extracted from the patient or cadaver George Sternberg expressed succinctly the constraints associated with locating the microbe. "Evidently any organism concerned in the etiology of an infectious disease should be found not occasionally and in certain cases only; but if seen at all by the staining-methods adopted, it should be found distributed through the organs involved in sufficient numbers to leave no doubt as to its presence, not as an accident, but as a general and constant thing in all cases of the disease under investigation."[49] In his original work Sanarelli identified the *bacillus icteroides* in only a little over half of the cultures derived from his cases; he did not disagree with Sternberg on the desirability of complete association of germ with disease, but excused his failures by arguing that the bacillus was present only in small numbers and that he had worked under difficult conditions. Sanarelli proudly noted later that subsequent researchers not subject to these privations were much more successful. At the Charity Hospital in New Orleans, for example, Paul Emil Archinard and his colleagues found the bacillus in over 80 percent of their yellow fever patients, while Wasdin and Geddings achieved an even more spectacular record, failing to grow out cultures from their patients' blood or autopsy specimens in only 7 percent of the cases studied.[50]

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[46] Walter Reed and James Carroll, "The specific cause of yellow fever a reply to Dr G Sanarelli," *Med News*, 1899, *75* 325

[47] Sanarelli, "Yellow fever once more," p 737

[48] Eugene Wasdin and Henry Downes Geddings, *Report of Commission of Medical Officers Detached by Authority of the President to Investigate the Cause of Yellow Fever* (Washington, D C Government Printing Office, 1899)

Sternberg was suspicious of this bacillus which Sanarelli and his followers cultured so easily from the blood and tissues of yellow fever patients. Since his rigorous studies had not revealed such an organism, Sternberg suggested that the success rate was due to the confounding of the common colon bacillus with the *bacillus icteroides*. Sternberg knew that the former frequently caused secondary infections in a body ravaged by yellow fever. Sanarelli was also aware of this, however, and had carefully distinguished the customary secondary invaders of a diseased body from his bacillus in his original communication. He countered that advances made in bacteriological technique during the previous decade accounted for his success and Sternberg's failure, but did not elaborate wherein his technical advantage lay.[51]

Agramonte offered a second explanation for the prevalence of the *bacillus icteroides* among yellow fever patients. He believed that the bacillus was a contaminant from the skin of the patient that reached the researcher's culture medium when blood was drawn under non-sterile conditions. The researchers who had found the bacillus most frequently, Wasdin and Geddings, had used blood taken from the patient's earlobe. Agramonte argued that the "merest tyro in bacteriology" would know that the earlobe region could be rendered sterile only with great difficulty.[52] If blood were drawn instead directly from a vein in the elbow, using a sterilized needle and glass tube, the discovery rate of *bacillus icteroides* dropped dramatically, according to Agramonte's research.[53] Thus the basic issue of whether the *bacillus ic-*

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[49] Sternberg, "Bacillus icteroides," p 313

[50] Sanarelli, "Some observations," p 197, Paul E Archinard, R S Woodson, and John J Archinard, "Bacteriological study in the aetiology of yellow fever," *New York Med J*, 1899, *69* 109–14 Oliver L Pothier, who was the pathologist at the New Orleans Charity Hospital, also confirmed Sanarelli's discovery ("Summary of pathological and bacteriologic work done at isolation hospital, New Orleans, Louisiana," *JAMA*, 1898, *30* 884–88)

[51] George M Sternberg, "The bacillus icteroides as the cause of yellow fever—a reply to Professor Sanarelli," *Med News*, 1899, *75* 225–28

[52] Agramonte, "Bacteriological investigations," p 204

[53] *Ibid*, pp. 206–8

teroides occurred in all cases of yellow fever, as of course it had to if it were the specific cause of the disease, was in doubt.

One corollary to Koch's postulates was that the germ be located *only* in patients with yellow fever. A major task was to distinguish the pathogenic microbe from the host of bacteria normally resident in the healthy human body. Ideally, the germ would be found only in cases of yellow fever, not in any other disease or in the healthy individual. The bacteriologist also had to be careful that a secondary infective agent which invaded the body after its defenses had been lowered by the primary disease not be confused with the causative organism of the primary infection. Sanarelli maintained that the *bacillus icteroides* was found only in yellow fever, and in all cases of yellow fever (if studied properly). The suggestion that his bacillus was merely a secondary interloper, he held, was ludicrous; it was correlated far too closely with yellow fever not to be essential to the production of the disease. Furthermore, claims such as those put forward by Agramonte that the bacillus had been found in other diseases were the result of misdiagnosis.[54]

The most severe, and ultimately devastating, challenge to the specificity of Sanarelli's bacillus for yellow fever came from Reed and Carroll, who claimed that the *bacillus icteroides* so nearly resembled the bacillus of hog cholera as to warrant their identity or close kinship The two Army researchers found that the hog cholera bacillus and the *bacillus icteroides* produced strikingly similar infections in guinea pigs, that immunity to one was equivalent to immunity to the other, and that the two bacilli were indistinguishable by the usual laboratory tests based on growth conditions and media. Sanarelli professed astonishment at Reed's and Carroll's results, for he had never witnessed the animal symptoms, growth patterns and other phenomena observed by the American researchers. He assumed that they could only have "fallen victims of some deplorable neglect of technical precautions in the laboratory," and had tested a culture of hog cholera bacilli by mistake. Reed and Carroll countered by pointing out that their culture of *bacillus icteroides*, acquired from Pasteur's laboratory in Paris, bore the label of Sanarelli's Institute of Hygiene Agramonte strengthened the significance and implications of Reed and Carroll's argument by pointing out the ubiquity of cholera among hogs in Cuba, thereby providing a ready reservoir for the infection of humans debilitated by yellow fever or other diseases.[55]

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[54] Sanarelli, "Some observations," p 195, Reed and Carroll, "Specific cause," pp 321–29, Agramonte, "Bacteriological investigations," p 204

[55] Sanarelli, "Some observations," p 195 contains the disparaging quotation, Agramonte, "Bacteriological investigations," p 250 Reed and Carroll were familiar with the literature on hog cholera, and claimed that Sanarelli was not (although Sanarelli had recommended that they consult bacteriological literature on the subject) They asserted that Sanarelli was confusing two distinct diseases, swine plague and hog cholera. Theobald Smith, who had done much of the work on hog cholera, had himself pointed out to Reed and Carroll the similarity between *bacillus icteroides* and the hog cholera bacillus (Reed and Carroll, "Specific cause," p 322) A good summary of the information on hog cholera upon which Reed and Carroll based their work is Theobald Smith and Veranus A. Moore, "Additional Investigations Concerning Infectious Swine Diseases," *US Department of Agric[ulture] Bureau of Animal Industry, Bulletin No 6* (Washington, D C Government Printing Office, 1894)

The test of bacteriological identity which aroused the most interest among medical scientists was the Widal or agglutination test, introduced in 1896 for the diagnosis of typhoid fever.[56] Sanarelli asserted that the serum of yellow fever patients, containing antibodies specific to the yellow fever germ, agglutinated his *bacillus icteroides* in high dilutions, demonstrating that it must in fact be that germ. This phenomenon also presented physicians with a sure diagnostic test for yellow fever, if Sanarelli's theory was correct. Paul E. Archinard and his assistants at the Charity Hospital in New Orleans developed Sanarelli's suggestion into a precise test, and claimed to have achieved positive results in 70 percent of their yellow fever patients, while uniformly recording negative outcomes from healthy subjects or patients with other diseases. To Sanarelli's and Archinard's detriment, however, Agramonte showed that the serum of healthy humans, guinea pigs, rabbits and persons ill with other diseases all exhibited the same behavior when mixed with the *bacillus icteroides*. These false positive results occurred so frequently that Agramonte's findings demolished the diagnostic potential for Sanarelli's test and negated its use in establishing the germ's specificity for yellow fever. Furthermore, the hog cholera bacillus and the *bacillus icteroides* produced indistinguishable agglutination reactions in high dilutions, another sign of the similarity between the organisms. Sanarelli denied these results and said flatly that his experiments had led only to the conclusion of specificity that his theory demanded.[57]

The debates over the specificity of the *bacillus icteroides* for yellow fever were closely related to the next step in the Koch regimen, the production of yellow fever in laboratory animals from the purified culture. *Bacillus icteroides* offered no resistance to pure cultivation, propagation or preservation in the laboratory, but the diagnosis of yellow fever in laboratory animals proved to be a central point of controversy Sanarelli declared that he had produced undeniable yellow fever in the animals injected with the bacillus. Basing his diagnosis on fatty liver degeneration, persistent emesis and extensive congestion and hemorrhage, Sanarelli identified yellow fever in hundreds of inoculated animals. His opponents, who denied that the pathognomonic signs relied on by Sanarelli were specific to yellow fever, particularly attacked his understanding of yellow fever's action on the liver. Sanarelli had, according to his critics, limited his investigations to the gross anatomy of the liver, while a microscopical inspection was necessary to reveal the distinctive changes of yellow fever. Agramonte produced Sanarelli's cardinal signs in guinea pigs by administering several different bacilli of the colon family. In his analysis of the Sanarelli affair, William H. Welch of the Johns Hopkins pointed to the fact that Sanarelli himself based his arguments most heavily upon the evidence gathered from his animal experiments; Welch believed that the uncertainty regarding laboratory production of yellow fever was the central issue in the verification of Sanarelli's discovery.[58]

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[56] Hermann M Biggs and William H. Park, "The serum-test for the diagnosis of typhoid fever ," *Amer J Med Sci*, 1897, *113* 274–98

[57] Paul E Archinard, R S Woodson, and John J Archinard, "The serum diagnosis of yellow fever," *New Orleans Med Surg J*, 1897–98, *50* 455–70, Agramonte, "Bacteriological investigations", Sanarelli, "Some observations" and "Yellow fever once more"

It remained for Sanarelli's anti-amarylic serum to be tested. Through the agency of the New York *Herald,* one hundred doses of the serum were sent from Montevideo to the Sanarelli enthusiast Paul E. Archinard at the Charity Hospital, where in the fall of 1897 he administered the treatment to fourteen yellow fever patients. "This agent, in our hands, has shown no curative powers whatsoever," he unhappily concluded. "None of the important and dangerous symptoms of the disease having been in any way mitigated, or prevented, by its administration." Although some of the cases treated were well advanced and severe, Archinard believed that if the serum had any therapeutic value, some change in the patient's condition should have been apparent. There was none, as he observed with disappointment. Archinard also had doubts about the serum's prophylactic value. "Experiments performed on smaller animals in our laboratory do not warrant us in entertaining a high regard for its immunizing power," he reported.[59] Although Sanarelli continued to defend assertively his own results with the anti-amarylic serum, most physicians found Archinard's conclusions more convincing.

Even if the etiological explanation offered by Sanarelli had been satisfactorily validated by bacteriological procedures, it still had to satisfy the criteria established by the natural history tradition regarding yellow fever. Although the *bacillus icteroides* proved unfortunately resistant to the effects of freezing temperatures, on other counts it successfully meshed with other known facts about yellow fever. Sanarelli discovered that the addition of mold to his culture dishes accelerated the reproduction of his bacillus, a behavior consistent with the preference of yellow fever for moldy holds of ships and decaying organic matter. Both provided an environment ideally suited for the germ's propagation.[60] One contemporary New Orleans physician commented that Sanarelli's description of the toxin secreted by the *bacillus icteroides* illuminated the pathological course of yellow fever. "No explanation has ever been offered more satisfactory to our pathological and clinical sense," he declared effusively, "and that will better account for the train of symptoms that identify this disease—fever, vomiting, hemorrhages, albuminuria, anuria, fatty degenerations of the liver, kidneys and heart—than the effects of the toxin so clearly and impressively described by Sanarelli.[61]

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[58] Comments of William H Welch, "[Proceedings of] The Johns Hopkins Hospital Medical Society Meeting of February 21, 1898," *Bull Johns Hopkins Hosp*, 1898, *9* 119

[59] Paul E Archinard, "Experiments performed at the Charity Hospital of New Orleans and elsewhere, with Sanarelli's anti-amarylic serum in the fall of 1898," *New Orleans Med Surg J*, 1899–1900, *52* 85–86

[60] The editors of the *British Medical Journal,* for example, were highly impressed by the power of Sanarelli's theory for explaining the "peculiar manner in which the yellow fever contagium clings to old badly-ventilated ships and damp houses" ("The bacillus of yellow fever," *Brit Med J*, 1897, *2* 96)

[61] Matas, "Discussion," p 233

A South Carolina bacteriologist, who set for himself the explicit task of determining whether Sanarelli's bacillus was consistent with the natural history of yellow fever, was also thoroughly satisfied with the microbe. The characteristics of the bacillus explained yellow fever's association with moisture, heat and filth, as well as the phenomenon of sporadic cases and indigenous epidemics. Since the spores of *bacillus icteroides* resisted drying and showed great endurance if packed in a trunk or stored in a basement, the bacillus could easily survive to generate a new epidemic when favorable climatic conditions next appeared. Thus the transmission of the disease by material objects was explained.[62] Most physicians believed that Sanarelli's bacillus had met the criteria for acceptance established by the traditional natural history of yellow fever.

It is likely that Sanarelli's work achieved such rapid, broad acceptance among American physicians in large part because it explained the accumulated wisdom about yellow fever so successfully. Unsophisticated in bacteriological technique, the majority of American physicians could only have been impressed by the number and extent of Sanarelli's experiments, which led them to believe that the burden of proof lay with Sternberg and his supporters. Southern physicians familiar with the natural history literature on yellow fever were easily convinced by the compelling consistency of Sanarelli's theory with existing knowledge about the disease. On the other hand, there is some evidence that American bacteriologists, in contrast to the bulk of the medical profession, shared the spirit of caution evident in the remarks of Simon Flexner on Sanarelli's work. "Most bacteriologists," commented Flexner in 1900, "believe that Sanarelli has done no more than point out the existence of a hitherto unknown pathogenic micro-organism in the bodies of a certain percentage of persons dead of yellow fever."[63]

Whatever may be said about the breadth of acceptance of Sanarelli's discovery in the late 1890s, by 1902 the *bacillus icteroides* was widely discredited. "A few years since almost the entire profession accepted without reservation the claims of Sanarelli, which claim was completely dissipated by closer study," an Alabama medical journal editorialized in requiem. "The *bacillus icteroides* is no longer accepted as the pathogenic agent of yellow fever, and the time has about arrived for the introduction of some new aspirant for professional favor."[64] Reflecting this turn of events, Reed crowed in a letter to William Crawford Gorgas: "Sanarelli is out with a terrific blast!"[65]

No particular experiment or argument led to the demise of the *bacillus icteroides*. Sanarelli scorned the work of Reed, Carroll, Sternberg and Novy, pointing out that none of them had gone to a yellow fever area and worked with his bacillus, testing it on site as Wasdin and Geddings had done. This criticism was defused by Agramonte's experiments in Cuba, followed by the work of Reed and Carroll in the same location. One suspects that the opinions of Reed and Carroll with regard to the *bacillus icteroides* also commanded much greater respect after the verification of the mosquito vector of yellow fever in 1900 had elevated their standing among medical researchers. Another factor contributing to the downfall of the *bacillus icteroides* was that the many ardent supporters of Sanarelli working at various locations around the world achieved such inconsistent results in their experiments with the germ. Although researchers of the Marine Hospital Service continued to search for the *bacillus icteroides* in mosquitoes into the early years of the twentieth century, Sanarelli's discovery suffered almost as rapid a decline in scientific popularity as it had enjoyed in rising to medical attention.[66]

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[62] Robert Wilson, Jr, "The etiology of yellow fever," *Yale Med. J*, 1897–98, *4* 221–28

[63] Comments of Simon Flexner in the discussion following Wasdin, "Yellow fever," p 875

[64] "The yellow fever germ," *Mobile Med. Surg J*, 1902, *1* 617–18, p 617

[65] Walter Reed to William Crawford Gorgas, 3 October 1901, Reed Papers.

What is perhaps most striking about the etiological debates surrounding the Freire and Sanarelli yellow fever germs is the extent to which the participants shared common assumptions about the pathogenic potential of microbes and the process of etiological verification. In sharp contrast to the first two-thirds of the century, the yellow fever literature of the 1880s and 1890s was practically devoid of doubt that yellow fever was caused by a germ. Nor was the proper method of demonstrating the specificity of a germ to a disease in question. The focus of etiological debate in large measure shifted to performance, to the technical skill of the researcher. Controversies increasingly came to center around technical issues, such as the proper method for drawing blood samples or for distinguishing the pathognomonic character of fatty degeneration in the liver. As the Sanarelli case shows well, such limited disputes could nonetheless grow quite heated, for upon such technicalities the competence and reliability of a researcher's claims were judged.

That the tacit rules for etiological proof and assumptions about bacteriological evidence held by many late nineteenth-century American physicians are revealed by a germ hunt that yielded no enduring trophies underscores the historiographic worth of studying false discoveries. In appraising and contesting the pathogenic claims made on behalf of the various yellow fever germs, American researchers were compelled to consider carefully the appropriate criteria for rejecting a bacteriological discovery, and in the process their standards for validating an etiological agent were lucidly displayed. Further, the case of yellow fever illustrates the value of analyzing one particular disease in order to understand the process of bacteriological arbitration rather than approaching bacteriology as a monolithic entity. At issue in the etiological disputes of the late nineteenth century was not bacteriology as a whole; it was the attribution of specific diseases to particular germs.

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[66] Sanarelli, in "Yellow fever once more," p 742, charged his opponents with arm-chair theorizing Reed and Carroll countered with impressive evidence drawn from their Cuban investigations in "A comparative study of the biological characters and pathogenesis of bacillus x (Sternberg), bacillus icteroides (Sanarelli), and the hog-cholera bacillus (Salmon and Smith)," *J Exper Med*, 1900–1901, *5* 215–70

Assessing attitudes toward the growth of bacteriology in the aggregate, rather than focusing on more narrow debates over the causation of individual diseases, tends to mask the uncertainties and immediate concerns that faced physicians who sought to come to terms with the etiology of a particular disease. Examined in the context of yellow fever, the skeptical attitude toward bacteriology held by many prominent American physicians seems not a reactionary but a temperate, prudent response to a barrage of research reports of varying reliability. Thus a physician such as George Sternberg could at the same time be a bacteriological enthusiast and a most vocal critic of claims to link certain specific microorganisms to certain diseases The physician who accepted the germ theory as the most likely explanation for infectious diseases could and often did oppose the practical aspects of a particular etiological proof, but such opposition did not necessarily entail a challenge to the methodological principles and fundamental precepts of etiological theory grounded in bacteriology.

NOTES AND COMMENTS

A CASE BOOK OF THE PHILADELPHIA ALMSHOUSE INFIRMARY. DR. JAMES RUSH ATTENDING PHYSICIAN [8 OCTOBER 1819 TO 10 FEBRUARY 1820]*

R. M. Price

A small and battered students' case book, recently acquired by the Wellcome Library, conveniently focuses the related themes of early American medical institutions, medical education, hospital practice and therapeutics; and it is closely related to certain distinguished early American medical personalities. It is possible through it to glimpse a little of what it was like to treat the poor; and, without too much imagination, to feel what it was like to be the poor so treated. This note is intended to indicate possibilities for future interest and research.

More information would certainly be gained by study of associated material from the Philadelphia General Hospital in the City Archives of Philadelphia. Among the Philadelphia General Hospital Archive of some 1,000 volumes and 13,000 individual manuscripts is a series of similar case notes dating from 1815 to the late nineteenth century. So far used primarily for sociological information, these might well yield dividends to the active and understanding enquirer into early American institutional medicine.[1]

The Wellcome case book is indeed little to look at. Its upper cover and many of its 105 leaves are as yet still detached from the remainder. The leaves measure 20 × 16 centimeters; many of the (probably blank) pages have been torn out, apparently in careless need, and the remaining pages are written in several dashing and scrawling hands as time allowed. These appear to be the hands of the four students of the "firm," C. J. Wilstach, R. E. Griffith, D. [J.] Atkins, and C. E. Craven, whose names appear on the detached upper cover. Of these we only have biographical details of R. E. Griffith, probably the overseer of the case book, whose initials appear within the device of a snake swallowing its tail, with the motto "Prud^{ca}" below. Of Griffith, more later

As readers of Packard and other historians (e.g., Radbill) of early

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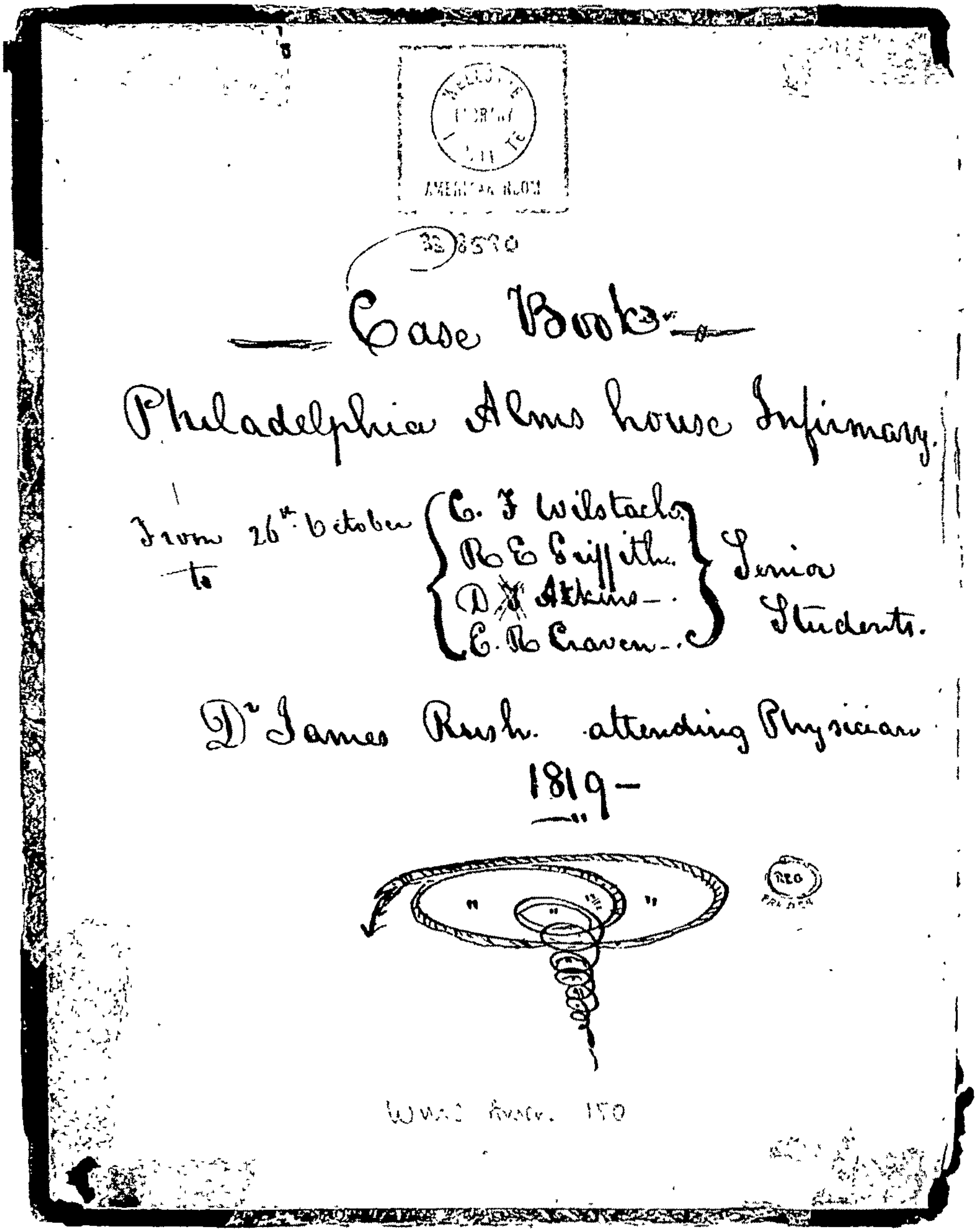
* Presented at the fifty-seventh annual meeting of the American Association for the History of Medicine, San Francisco, California, 5 May 1984 The author wishes to acknowledge the courteous and generous advice of Lloyd G Stevenson and to thank Whitfield J Bell, Jr , Janet Golden, Diana Long Hall, Allen Weinberg, and Edwin Wolf II for so generously remedying the difficulties of transatlantic research.

[1] Allen Weinberg (City Archivist, City of Philadelphia), private communication dated 2 March 1984



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Case Book—

Philadelphia Alms house Infirmary.

From 26th October
to

C. F Wilstach
R. E. Griffith
D. Atkins
E. R. Craven

Senior Students.

Dr James Rush. attending Physician
1819–

WMS Amer. 150

Fig 1. Title page of the case book of the Philadelphia Almshouse Infirmary Courtesy of the Wellcome Institute Library, London

American medicine will know, the rival primacy of the Pennsylvania Hospital and of the Philadelphia Almshouse Infirmary in the provision of hospital care remains a matter of contention. Suffice it to say that while the Pennsylvania Hospital was the first to offer medical care for all, the Infirmary had handled cases from the Philadelphia Almshouse since 1732. It is a matter of record that the Infirmary served by R E. Griffith and by James Rush as attending physician was the second devoted to that purpose, in use from 1768 until 1833, on Tenth and Eleventh Streets between Spruce and Pine.[2]

Some details of medical education in the Infirmary will appear later under the brief description of the medical life of the Infirmary. At present we may note that the two classes of pupils living in the Almshouse by 1802 had in 1811 been increased from one to four in each class of Senior and Junior Pupil (or Student). Thus, during the period of the case book, there were four Senior Pupils who attended the patients and took case histories, and four Junior Pupils who dressed cases, cupped and bled patients, and reported cases of illness to the Senior Pupils.

During 1820 the name of house pupil was to be changed to house physician or house surgeon. These pupils were also known as apprentices and had to pay a fee to the Almshouse for the privileges of their position.[3] Such pupils may, or may not, have been part of the approximately forty students from the University of Pennsylvania who enjoyed clinical teaching at the Infirmary in 1819[4]

Robert Eglesfeld Griffith (1798–1850), seemingly the most active of the four Senior Students, was certainly a student of the University as well as of James Rush, since he graduated M.D with his thesis on the "Stomach and Its Functions" from Pennsylvania in 1820. It appears that Griffith made the most vigorous use of his talents and privileges, since after practicing in Philadelphia he became Secretary to the Board of Health (1826 until at least 1828), then its President (1833–36), passing successively to the professorship of materia medica at the Philadelphia College of Pharmacy (1835), to the professorship of materia medica, therapeutics, hygiene and medical jurisprudence at the University of Maryland (1836–38), and thence to the professorship of practice, obstetrics and medical jurisprudence at the University of Virginia (1838–39). In 1839 ill-health forced him to return to Philadelphia where in 1849 he became Vice-President of the Academy of Natural Sciences shortly before his death. During a busy existence he found time to write *Medical Botany* (1847), the *Universal Formulary* (1850); and to edit Ballard and Gerrod's *Elements of Materia Medica and Therapeutics* (1846), Christison's *Dispensatory or Commentary on the Pharmacopoeias of Great Britain (and the United States)* (1848), and Taylor's *Medical Jurisprudence* (1845). He also edited the *Journal of the Philadelphia College of Pharmacy* (1831–35) and the *American Journal of Pharmacy* (1835–36). In addition he became known as a botanist and conchologist.[5] In all, a valiant range for an active physician whose life span was only fifty-two years

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[2] Francis R. Packard, *History of Medicine in the United States*, 2 vols (New York. Paul B Hoeber, 1931), 1 246–53, Samuel X Radbill, "How and when the Philadelphia General Hospital, Blockley Division, was founded," *J Phila Gen Hosp*, 1954, *5* 3–9, at p 8, probably using Frederick P Henry, *Founders' Week Memorial Volume* (Philadelphia City of Philadelphia, 1909), p 424, as his source See also John W Croskev, comp, *History of Blockley A History of the Philadelphia General Hospital from Its Inception, 1731–1928* (Philadelphia F A. Davis, 1929) and Edwin Wolf II, "The Doctors Rush," in *The Annual Report of the Library Company of Philadelphia for the Year 1961* (n p, 1961), pp 9–19

[3] Packard, *History of Medicine in the United States*, 1 250–51

[4] D Hayes Agnew, "The Medical History of the Philadelphia Almshouse," in Croskev, comp, *History of Blockley*, pp 18–63, at p 37

The life of James Rush (1786–1869), better known than that of his pupil Griffith, not only as the second child of Benjamin Rush, but also as the eccentric, embittered, and reclusive early American student of psychology, needs only brief treatment. Only twelve years older than Griffith, Rush's early advantages had led him to follow in his father's footsteps to Princeton, thence to an M.D. from the University of Pennsylvania in 1809, returning from further study in Edinburgh and London to practice regularly from 1811 until about 1828 when he began to retire from active practice and social life following the publication of his *Philosophy of the Human Voice* (1827). This book has awarded James Rush an early and perhaps prime place in American psychology. His long retirement gave him time to reflect upon and to write his monumental *Outline of an Analysis of the Human Intellect* (1865), a largely mechanistic account of the thought process now also regarded as a pioneer work on psychology[6] We may need to bear in mind not only his retirement from the world but his prickly attitude towards it, as his comments on his preceptors witness; for example, on Benjamin Smith Barton who taught him materia medica and botany at the University of Pennsylvania, 1808–9: "A mass of affectation & vanity, a large burden of ill-temper, a little heap of knowledge, and not a mite of genius though altogether matter enough in mind to have bred it"[7]

Turning therefore to the case book itself, we find the hospital enjoying a fortunate peace between two epidemics: the first, possibly of typhus, and so reported by James Rush, which lasted until April 1818, and the second, also a malignant fever, which broke out during the summer of 1820. Interestingly, reports of the second fever were suppressed by the students in order, as they claimed during the ensuing enquiry, to prevent further panic.[8] The manuscript thus presents the life of the hospital during a routine phase, with the slight spice of a mild epidemic of measles in Philadelphia, as the three cases of the total of twenty-two during the four months covered by the case book testify

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[5] See his entry in Howard A. Kelly and Walter L Burrage, eds , *Dictionary of American Medical Biography* (New York D Appleton, 1928), p 500

[6] Franklin S Klaf, "Benjamin Rush's son," *Amer J Psychiat*, 1961, *118*(2) 174–75, and Stephen G Kurtz, "James Rush, pioneer in American psychology, 1786–1869," *Bull Hist Med*, 1954, *28* 50–59

[7] Whitfield J Bell, Jr , "Dr James Rush on his Philadelphia, Edinburgh, and London teachers," *J Hist Med*, 1964, *19*. 419–21 The quotation appears on p 419

[8] Charles Lawrence, comp , *History of the Philadelphia Almshouses and Hospitals* (Philadelphia By the author, 1905), pp 63–64

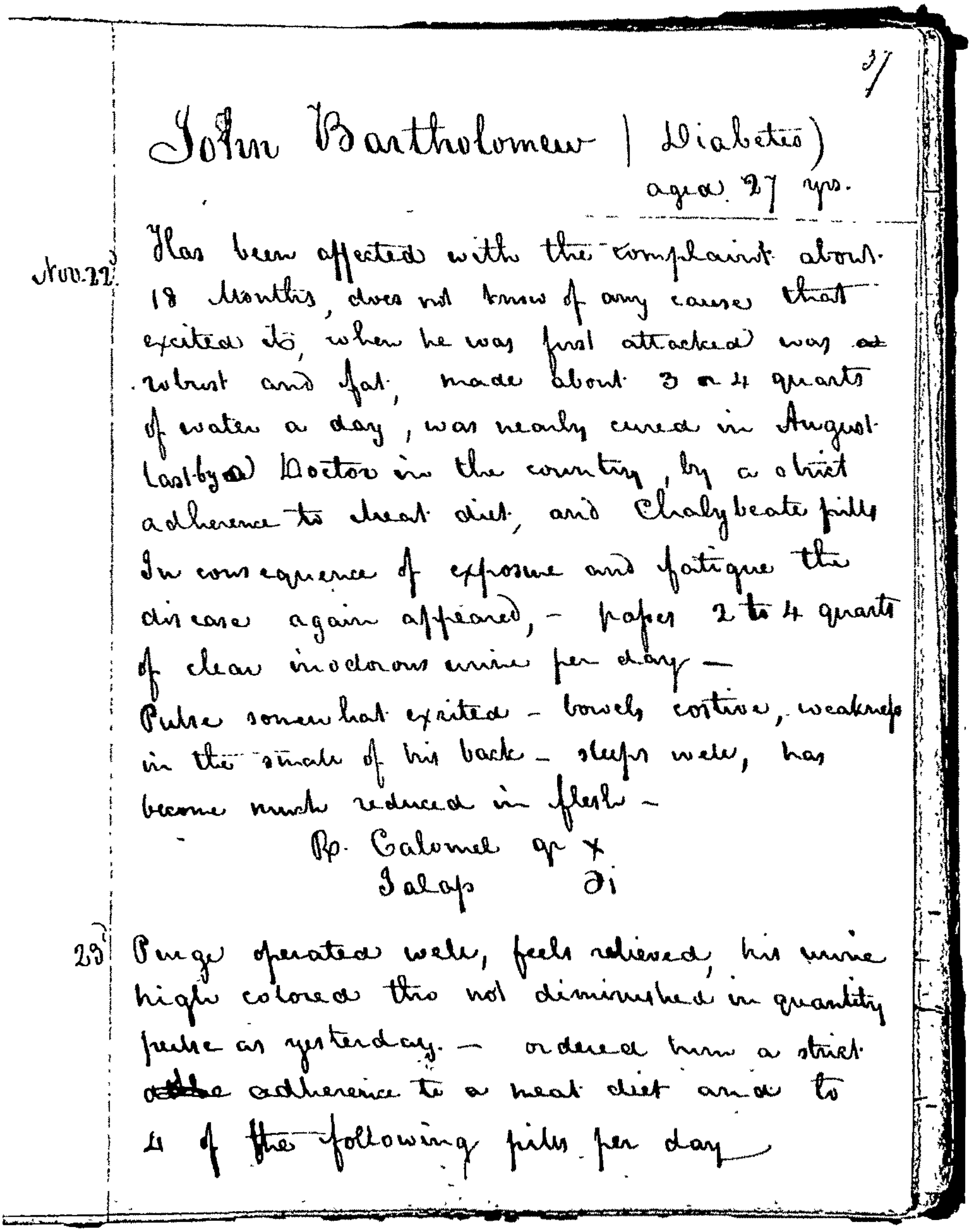
Cases are therefore varied. Pneumonia and dropsy (with two, possibly three cases each), two intermittent fevers, one "typhus disease," one "disease of liver," one angina pectoris, one strangury of urine (*"stillicidium urina"*), one "perotinitis," one diabetes, and one "fistula in perineo" are included among them. The emphasis on fevers, pneumonia and dropsy, is nothing untoward, as neither indeed was their treatment by bleeding, purging and puking. The comment of a Senior Student, about a fifty-six-year-old black patient named Robert Duff, who was suffering from dropsy, "bled or purged every day," is typical enough, it might well be the title of the present brief notice of the case book. Venesection and purges were the favourite strategies of James Rush.

Of the twenty-two patients admitted during this period, thirteen were male and nine female (one a child), of whom sixteen we may adduce were white, five black, and one, the child, a mulatto. Four patients died, making the mortality 18 18 percent of admissions. Obviously this sample over a brief period is far too small to be of statistical significance as to disease pattern or indigent population treated. The treatments and trends of illness will be of some value to future researchers when studied in relation to the series of case books in the Philadelphia City Archives.

Hours and manner of medical attendance are of some passing interest. James Rush seems to have visited the Infirmary's wards regularly once or twice a week according to need, and to have made a point of seeing patients as soon after admission as possible. If necessary he visited some patients at least three times; his continual attendance on James Kinney, aged twenty-one, ill of an "intermittent fever," whose case notes cover some ten-and-a-half pages of the book and two months of time was unremitting and apparently successful. Similarly, a case of diabetes, suffered by John Bartholomew, aged twenty-seven, after continued purging was at last controlled by "an animal diet" over some three weeks and three visits He was discharged "cured"; temporarily as we must assume

Cases were noted methodically by the students, who recorded name, sex, age, race, and the nature of illness if instantly determinable. A brief description of symptoms on admission follows, with notes of James Rush's orders for treatment and further notes of any additional treatment ordered by the students, occasionally and more stringently re-corrected by Rush. One autopsy was performed—on Eleanor Logan, aged thirty-six, who died after ten days' angina pectoris.

Another autopsy was sought on Michael Cochran, aged forty, who had arrived in the Infirmary with "distended abdomen and swelled legs" and with "purulent expectorations," who died after some three weeks. His relatives, however, prevented the examination of his body, thus leaving posterity to guess the nature of his complaint The notes are plain, straightforward



3/

John Bartholomew (Diabetes)
aged 27 yrs.

Nov. 22 Has been affected with the complaint about 18 Months, does not know of any cause that excited it, when he was first attacked was at robust and fat, made about 3 or 4 quarts of water a day, was nearly cured in August last by a Doctor in the country, by a strict adherence to meat diet, and Chalybeate pills In consequence of exposure and fatigue the disease again appeared, – passes 2 to 4 quarts of clear inodorous urine per day —
Pulse somewhat excited – bowels costive, weakness in the small of his back – sleeps well, has become much reduced in flesh –

Rp. Calomel gr x
Jalap ℈i

23 Purge operated well, feels relieved, his urine high coloured tho not diminished in quantity pulse as yesterday. — ordered him a strict ~~ad the~~ adherence to a meat diet and to 4 of the following pills per day

Fig 2. Notes on the case of John Bartholomew, suffering from diabetes Courtesy of the Wellcome Institute Library, London.

and often graphic in their brevity. It is easy to deduce that in the busy day of students active from at least 10 a.m (when James Rush made his rounds) to at least 10 p.m., notes were often written up retrospectively, and at great speed, between duties.

In brief, the case book encapsulates the charitable hospitalization available to the poor in a rich merchant city in early nineteenth-century America. It includes the therapeutics of a traditionally-minded physician raised in a rigorous school by his father; and it outlines some of the student experience of a twenty-two-year-old physician dynamic enough to become distinguished later in fields of medical learning and natural history. More research in this and related records will assess accurately the nature of the treatments and the place of the case book in its Philadelphian background and in medical history as a whole.

DIVERSITY AND PROFESSIONALISM IN AMERICAN MEDICAL HISTORY: THE AAHM IN THE 1980s*

James H. Cassedy

People looking at the formal North American medical history world from the outside, or those entering it for the first time, have often remarked on the extraordinary range of talent, intellect, social awareness, and culture of its devotees. It is quickly apparent, too, that its practitioners have come from various corners of civilized life—professional, intellectual, economic, and social. In the makeup of the American Association for the History of Medicine, this diversity is particularly apparent.

Recent analysts of this small scholarly field have focused most of their attention upon three of its largest segments: first, the practicing physicians, for whom medical history usually remains an avocation, albeit an engrossing one; next, academic physicians with training in history; and finally, professional general historians and historians of science. But other groups—history of medicine librarians, museum curators, rare book dealers, government and foundation administrators—have become increasingly conspicuous. And talented individuals from numerous other milieus or specialties also steadily find their ways into this one.

The diversity and complexity of our field today, as well as its vigorous health, is equally illustrated by the impressive number of organizations, in addition to this Association, that are exclusively devoted to the pursuit of medical history, or to some aspect of it. These are not, it seems to me, rivals of this Association or of each other. All have their own individual scopes and purposes. Most are essentially historical specialty groups. We now have such bodies as the American Institute of the History of Pharmacy, the American Academy of the History of Dentistry, the American Veterinary History Society, Cheiron (concerned with the history of the behavioral sciences), the Halsted Society (devoted to surgical history), a society for the history of anesthesiology, another for the history of chiropractic, and more. There is a vigorous Osler Society, a relatively new Canadian Society for the History of Medicine, a rapidly growing Society for Ancient Medicine, an increasingly productive Association of Librarians in the History of the Health Sciences, and, within

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* This paper was presented in slightly different form as the Presidential Address to the American Association for the History of Medicine at its fifty-seventh annual meeting in San Francisco, California, 4 May 1984, under the title, "From Shryock's Box. Pleasures, Pains, and Prospects of the History of Medicine in America."

Bull Hist Med, 1985, *59:* 390–394

our own Association, a loosely organized but effective caucus of trained physician-historians.

One remarkable thing about all of these bodies is how new they are; virtually all were launched after World War II. Our field has come a long way from the simple decades of the 1920s and 30s, when this Association was the only national body actively serving medical history. On the way to its own prosperous maturity, the AAHM encouraged and affiliated with many of these developing medical history specialty bodies And, in the process, it became itself a sort of informal umbrella-organization.

As such, the AAHM has thus remained a body where all of the different kinds of medical history specialists, as well as the non-specialists, can meet and interact with each other. It is a place where they can gain needed exposure to and nurture from the varied intellectual and occupational currents which comprise the larger field of the history of medicine. So far, we have not devoted very much systematic thought or effort toward strengthening or enhancing these values and processes within our Association. A good deal of work needs to be done on the umbrella—patching it certainly, enlarging it maybe. We need to look more diligently than we have in the past for ways to make all of medical history's components or interest groups truly welcome here. And we need to take far greater advantage of our diversity of talent, perhaps by encouraging even more caucuses or cabals or sections.

The pleasures to be obtained from medical history, as most of us find out at an early stage, derive only partly from participation in the activities of this Association or of the other organizations. Many or most are very private. For some, the epitome of satisfaction may lie in purchasing at an auction or bookstore that long-searched-for edition of William Harvey or Claude Bernard. For those who find time to write, of course, there are pleasures both in the research and in seeing one's articles and books in print. And, for librarians and teachers, there are the substantial pleasures of guiding others to the intellectual riches of our field

Another source of pleasure for many of us, especially now that the formalized pursuit of medical history in this hemisphere has acquired its own past, is our opportunity to indulge in genealogical contemplation, in historiography. As a group, we have a well-developed collective consciousness of our professional forebears. We recognize that our field as a whole was shaped, a generation or so ago, not only by European pioneers, but by now notable native Americans of various kinds by such medical librarians as Fisher, Garrison, Gnudi, and McDaniel, by physician scholars from Billings and Krumbhaar to Corner and Rosen, by such collectors and specialists as Cushing, Clendening, Osler, and Wangensteen; and by a few general historians such as Shryock and O'Malley. This Association is a place where the accomplishments of these forebears can be kept alive in the historical memory, but at the same time the diversity of our membership tends to shield us from the excesses of medical history hagiolatry

It is worth noting here that not every scholarly organization provides its members with the opportunity of worshipping their professional ancestors for as low a fee as this one does. We have every reason for self-congratulation about this. In fact, low fees, along with our small scale of operation and personal ways of carrying on our activities, have been responsible for much of the enjoyment we find in this Association. We have made it a point of pride as well as of pocketbook to keep the bureaucratic mechanics and frills to a minimum; we have managed to avoid setting up a full-time business office; and we have denied ourselves the luxury of paying an executive director to dream up expensive programs.

Our low fees have been possible because we have had good friends. Many of these are Association members whose concept of "paying their dues" to the medical history profession leads them to go beyond the mere submission of a nominal annual sum and also undertake some unpaid scholarly or other task as a natural adjunct of professional life. Certainly in this category are the numerous members who have been willing to accept laborious committee work. And even more conspicuous is that heroic succession of unpaid Secretaries and Treasurers who have put in so much time and effort over the years to keep our Association afloat.

The Association has also had outside benefactors. Certain of these have been connected with foundations which made us a number of unsolicited program grants in recent years. Others are associated with the Johns Hopkins University, with which the Association has had a special and beneficial relationship. We should particularly keep in mind the University's support of our official organ, the *Bulletin of the History of Medicine.* That support relieves us of much complex and tedious editorial labor, while it also subsidizes a large portion of the subscription costs which we as AAHM members would otherwise have to pay.

Whatever its dues, of course, and however *gemütlich* its members and activities, there is a limit to the pleasures that this or any association can bestow. It meets but once a year. The Association certainly provides a unifying focus for medical history interests and energies, but it cannot by itself keep those enthusiasms burning brightly throughout the year. It stimulates and provides some guidelines for teaching, researching, and perhaps even collecting in medical history, but in the end the execution of these activities is largely an individual or local matter.

Despite its limitations and discontinuities, the Association plays a continuing central role in the advancement of professionalism in the history of medicine. Professionalism was not always an important consideration in this field. But in recent decades it has become an increasingly sought after quality. At least from the 1920s, it was evident that medical students deserved well-qualified medical history professors as much as they deserved qualified anatomy or chemistry professors. It was equally evident that management of the burgeoning rare medical book collections required librarians with exceptional skills. And it also became clear that writers of medical history, just as surely as writers of epidemiological or embryological tracts, should be expected to have high degrees of training and competence However, outside of the small Sigerist circle at Hopkins during the 1930s and early 40s, there was relatively little formal professional development in the field until the general academic and scholarly takeoff that followed World War II. In that exciting and dynamic post-war atmosphere, medical history began to flourish and expand as no one a generation earlier would have believed possible. It was not only in the multiplication of medical history societies that has been noted. It was also in the expansion of teaching departments of medical and science history; the growth of medical rare book collections; the formation of new medical history and history of science periodicals; the initiation of programs of fellowships and research grants by foundations and governments, and the proliferating of seminars and symposia. All of these developments both represented and fostered a greater professionalism in medical history.

The effects of this professionalizing process during the past quarter-century have been both good and bad. On the plus side, there is abundant evidence of accomplishment—in the large increases in numbers of academic courses offered and the higher standards of teaching medical history; in the explosion of medical history writing and the better and more varied models for writing; in the greatly expanded libraries and archives; in the miscellany of activities directed at stimulating, administering, evaluating, and elevating teaching and research in the field. On the other hand, it is no exaggeration to say that one who wanted to could probably now spend a large part of his or her scholarly career on the mechanics of professionalism—attending committee meetings, going to symposia, and refereeing other people's manuscripts. And, as one observes the busy professional at work in the 1980s—glued to the long-distance telephone for long stretches and to the photocopy machine and computer for still more hours—other questions about modern professionalism arise. At the least, we have to ask if our self-image of medical historians as sheltered, old-fashioned, leisurely, other-worldly souls may not have to be revised.

The need for such a reassessment becomes further evident when we realize the extent to which our professionalism has become imbued with the stop-watch mentality of contemporary scholarly peripateticism, with jet age impatience and ulcers. The patterns of this were taking shape in the days of Sigerist, Shryock, Fulton, Viets, and Rosen But those scholars and their contemporaries still normally used the train for their busy consulting trips, most of which were confined to the east coast. So it has been left to our own generation, with the burgeoning of medical history programs and interests in all sections of the country, to watch the age of airport medical historiography come into its own.

Unfortunately, the more professional our field becomes, the more preoccupation there seems to be with the minutiae of scholarly life, and the less time for enjoyment of the substance. Some of us become slaves to footnotes and jargon, and at what dreadful cost to readability, style, and possible communication with the public. Some of us make artificial and pointless attempts to divide ourselves into internalists and externalists. All too often, in following fashionable new schools of historical inquiry, we lose sight of the merits of the old. And, in our field, too, as in other scholarly arenas, I regret to say, what passes for professional intercourse too often degenerates into ill-tempered controversialism, nit-picking, or adversarial posturing.

A different concern that I used to share with many of you was that of the threatened mechanization and computerization of our libraries and the presumed ill-effects of these upon the life of learning, upon the pursuit of medical history scholarship. I can now report that these are no longer threats. Mechanization arrived among us the day before yesterday and is here to stay. In fact, members of our field seem to have accepted the inevitable and to have adjusted to the new facts of life reasonably well, though sometimes grumpily.

A final and different kind of challenge is posed by the need to work out a better fit between the exacting demands of medical history professionalism and the other interests and needs of our Association's diverse membership. Professionalism is a trait or ideal that ought to be, many would say, the pride and the very excuse for existing of any scholarly organization. It is not that simple for us. We are still far from being sure just what to do with it now that it is here. We squabble mildly over what kind of professionalism we should have, or rather, how to accommodate the aims of several kinds of professionals. But, above all, we do not yet know how to reconcile our urges to professionalism with our desires to continue serving the many amateurs in our midst. Our Association's agenda for the remainder of the twentieth century should assign a high priority to the discussion and resolution of this fundamental problem of medical history diversity.

AMERICAN ASSOCIATION FOR THE HISTORY OF MEDICINE REPORT OF THE FIFTY-EIGHTH ANNUAL MEETING

Durham and Chapel Hill, North Carolina May 15–18, 1985

The Fifty-eighth Annual Meeting of the American Association for the History of Medicine was held in Durham and Chapel Hill, North Carolina, May 15–18, 1985 Sessions were held at the campuses of Duke University and the University of North Carolina. The final session was held at the Sheraton University Center, Durham. The Duke University School of Medicine offered 15½ credit hours of ACCME continuing medical education credit in Category I for meeting participants.

The following report, which includes the program, abstracts of the minutes of the Council and Business Meetings, as well as the financial report for fiscal year 1983–84, has been prepared by the Secretary-Treasurer, Dr. Edward C Atwater, and is intended for the information of the members of the Association The official minutes and financial report are preserved in the office of the Secretary-Treasurer

PROGRAM

Wednesday, May 15

6:00 p m Welcoming Reception
7.30 p.m Council Meeting

Thursday, May 16

8.45 a m. Welcome, William G Anlyan
Robert P. Hudson, *presiding*
9.00 a.m. Two Books and Two Nations
Robert J T Joy, *presiding*
"The Pig That Fell into the Privy," James Harvey Young
"Medical Nemesis· Paris, 1894 *Les Morticoles* by Leon Daudet," Toby Gelfand
10.30 a m A. Ethical Problems in Historical Perspective
Chester R. Burns, *presiding*
"Hearts and Souls. The Historical Evolution of the Imperative to Resuscitate," T Forcht Dagi
"Ethical Pseudo-Issues in Early Twentieth-Century Tissue Transplantation," David Hamilton
" 'The Black Stork' The Debate Over an American Movie Advocating Euthanasia of Deformed Newborns, 1916–27," Martin S. Pernick
B Psychiatry and Psychology in the United States
Martin A. Miller, *presiding*
"American Psychiatry and the Cause of Suicide, 1844–1914," Howard I Kushner
"Medical Language and Professionalization in Mental Testing, 1890–1929," Joanne Brown
"Alan Gregg and the Rockefeller Foundation's Support of Franz Alexander's Psychosomatic Research," Theodore M Brown

12:15 p.m. Luncheon Workshops

1. "English Medical Illustration after 1300," Peter Jones
2. "Integrated Teaching of Medical History and Clinical Radiology," Enrique Pantoja, F. A. Bavendam, and Ching Po Li
3. "Source Materials in the History of Medicine," Nancy Bruce, Janet Kubinec, Dorothy Whitcomb, and John Parascandola

2:00 p.m. Pentecostal Faith Healing in Historical Perspective

Todd Savitt, *presiding*

" 'Into Canaan's Fair Land': Brokenness and Healing in the Holiness-Pentecostal Tradition," Grant Wacker

"An Ethnological Description of Pentecostal Faith Healing Practices in North Carolina," Ruel W. Tyson, Jr.

Commentary. Harold Y. Vanderpool

4:30 p.m. Honors and Awards Session

Robert P. Hudson, *presiding*

Student Essay Awards

Osler Medal

Shryock Medal

Welch Medal Award

The Fielding H. Garrison Lecture

"Patterns of Scientific Creativity," Frederic L. Holmes

Friday, May 17

8:30 a.m. A. Black Health Care in America

Stuart Galishoff, *presiding*

" 'I Think They Are All Crazy'. Perceptions and Treatment of Insanity Among Blacks in South Carolina, 1800–1920," Peter McCandless

"Good-Bye to Jim Crow: The Desegregation of Southern Hospitals, 1960–68," E. H. Beardsley

"Medicine for the Masses: The Health Commission of the Improved, Benevolent and Protective Order of Elks of the World, 1927–52," Dennis C. Dickerson

B. Sectarians and Quacks

Norman Gevitz, *presiding*

" 'Wash and Be Healed' The Nineteenth-Century Water-Cure-Movement, 1840–1900 Simple Medicine and Women's Retreat," Susan E. Cayleff

"The Concept of Quackery in Early Nineteenth-Century British Periodicals," K. Codell Carter

"Tyrrell's 'Why We Should Bathe Internally'—Auto-Intoxication and Quackery in the Early Twentieth Century," Micaela D. Sullivan

C. Medical Care in Africa, Asia and Europe

K. David Patterson, *presiding*

"Foundling Hospitals in the Republic of Venice in the Sixteenth Century," Richard J. Palmer

"Changing Medical Technology and the Evolution of the Canton Medical Missionary Hospital, 1835–1950," Sara Waitstill Tucker

"Medical Care in Portuguese Colonial Africa, 1885–1974," Martin F. Shapiro

10:00 a m A. Medieval Medicine
Ann G. Carmichael, *presiding*
"Child Health in the Middle Ages as Seen in the Miracles of St. Thomas Becket and Other English Saints," Eleanora C. Gordon
"The Circulation of Medical Ideas in Thirteenth-Century Spain (Castile)," Luis García-Ballester
"A Fifteenth-Century Medical Scribe," Linda Ehrsam Voigts

B Issues of Professionalization
Steven J Peitzman, *presiding*
"Professionalization in the Provinces· The Surgeons of Marseilles in the Eighteenth Century," Steven J. Saba
"Location and Professional Conflict. Spatial Patterns of Allopaths and Non-Sectarian Physicians in San Francisco, 1840–1940," Neil Larry Shumsky and James Bohland
" 'Professional Courtesy' The Blackwell Medical Society and the Transformation of Professional Norms for Women, 1887–1907," Ellen More

12:15 p.m Luncheon Workshops

4. "The Race Question and Medical History," P Preston Reynolds
5. "Literary Sources for the History of Medicine," James S Terry and Sarah W. English
6. "Some Significant Factors to be Considered When Collecting Rare Medical Books," Bruce Ramer and Andrew T. Nadell

2:00 p m. A. Medicine, Politics, and the State: England and Germany
Russell C. Maulitz, *presiding*
"Helmontians, Not Puritans. The Social Basis of English Chemical Medicine in the 1660s," Harold J Cook
"Science, Medicine and the State: Medical Interest in the Institutionalization of Experimental Physiology at the University of Heidelberg, 1850–58," Arleen Tuchman
"The Decline of Medical Faculties in the Third Reich," Michael H. Kater

B. Medical Science
Robert Powell, *presiding*
"What's In a Name? The Aspirin Case," Jan McTavish
"Eberth, Escherich, and Enteric Fever," Dale C. Smith
"The Historical Riddle of Milk-borne Scarlet Fever," Leonard G Wilson

4:00 p m Annual Business Meeting
7:30 p.m. Banquet

Saturday, May 18

8:30 a.m. A. Epidemics and Epidemiology
Robert W. Prichard, *presiding*
"The History of Measles in Pre-Modern Japan. An Epidemiological Puzzle," Ann B Jannetta
"Sickness Rates and Trends in Europe, 1650–1900," James C Riley
"Yellow Fever in New Orleans: A Study of the Decline in Incidence of Yellow Fever in the Crescent City from 1861 to 1905," Dana G Ketchum

B. Topics in American Medicine
Martin Kaufman, *presiding*
"The Research Ideal: American Physicians in German Laboratories, 1850–1914," Robert G. Frank, Jr
"Ethnic Folk Heroes Between Bureaucracies. German Jewish Refugee Physicians in America, 1933–45," Eric D. Kohler
"From Toxicology to Policing the Industrial Environment· Occupational Medicine at the Charles F. Kettering Laboratory of the University of Cincinnati, 1920–50," Ellen Corwin Cangi
C. Medicine, Politics and the State. Russia
William Alton Smith, Jr , *presiding*
"Sechenov, Tsion and Pavlov· Conflict and Synthesis in Russian Physiological Psychology, 1860–1901," Daniel P Todes
"Revolution and Psychosis: The Mixing of Science and Politics in Russian Psychiatric Medicine, 1905–13," Julie V. Brown
"Russian Physicians and Medical Politics in the Revolution of 1917," John F Hutchinson
10·30 a.m A. Women and Childbearing
Judith Walzer Leavitt, *presiding*
" 'In a Delicate Way'· Pregnancy and Medical Concerns of Middle and Upper Class Antebellum Southern Women," Sally McMillen
"The Rhetoric of Responsibility: American Medical Responses to the Legalization of Abortion in the Soviet Union, 1920–36," Jonathan B Imber
"Philadelphia's Maternal Mortality Work: The CPC Approach vs. Penicillin," Dorothy I Lansing (read by Judith Walzer Leavitt)
B Medical Care in the United States
Curtis B. Worthington, *presiding*
"The Persistence of Scurvy in the U S. Army, 1819–60," Peter N Barboriak
"The Philadelphia Orthopedic Hospital and Infirmary for Nervous Diseases, Its Origins and First Decade," Lawrence C McHenry, Jr (read by his stepson, Spencer Morrison)
"Building Community Hospitals in Kansas City, Missouri, 1870 to 1915," Joan E Lynaugh

MINUTES OF THE ANNUAL MEETING OF THE COUNCIL

15 May 1985

The annual meeting of the Council of the American Association for the History of Medicine, Inc., was called to order at the Sheraton University Center, Durham, North Carolina, at 8 p.m President Robert P. Hudson served as chairman, and Edward C. Atwater as secretary The following Council members were present· Jeanne Brand (Vice President), James H Cassedy (Immediate Past President), Jerome J Bylebyl, Ann G. Carmichael, Philip Cash, Daniel M. Fox, William H. Helfand, Frederic L. Holmes, Judith W. Leavitt, Kenneth M. Ludmerer, G R. Paterson, Steven J Peitzman, and Morris H Saffron Regina Markell-Sanchez was absent

The minutes of the 1984 meeting were approved An abbreviated version was published in the Fall 1984 issue of volume 58 of the *Bulletin of the History of Medicine.*

The Secretary reported that there were 1,235 members as of 31 October 1984 This includes 1,142 regular members, 61 student members, and 32 Constituent Societies. One hundred and twenty-eight new members joined during the year, with a net gain of fourteen. Two states have over 100 members New York and California, four more have over fifty members Maryland, Pennsylvania, Massachusetts, and Texas, nine states and one province have over twenty-five members· Illinois, Minnesota, Ohio, New Jersey, Virginia, Connecticut, North Carolina, Wisconsin, Kansas, and Ontario.

The Council approved the application of the Central Illinois Medical History Club of Springfield for constituent society status.

Five American Association for the History of Medicine members were approved by the Council for membership in the International Society for the History of Medicine.

The Treasurer presented the financial report for the fiscal year 1983–84, ending 31 October 1984 The report was approved for presentation at the annual business meeting. The President appointed Genevieve Miller and W. Bruce Fye as auditors.

The increase of costs generally, particularly for postage and for printing, and the fact that the cost of the Association's activities was exceeding income, led the Council to recommend a dues increase.

The Garrison Lecture Committee (Robert J T. Joy, Chairman) recommended and the Council approved Gerald N Grob of Bridgewater, New Jersey, for the lectureship in 1986.

The William H. Welch Medal Committee (Gerald N. Grob, Chairman) reported and the Council approved the selection of Nancy G. Siraisi of New York's Hunter College as Welch Medallist for her book, *Taddeo Alderotti and His Pupils· Two Generations of Italian Medical Learning* (Princeton Princeton University Press, 1981)

The William Osler Medal Committee (Guenter B Risse, Chairman) recommended and the Council approved that the award should go to Joan R. Butterton, a medical student at Harvard, for her essay entitled "The Education, Naval Service, and Early Career of Dr William Smellie (1697–1763)"

The matter of whether eligibility for the Osler Medal Contest should be broadened to include medical residents and also the desirability of having winners present their papers at the annual meeting was discussed and referred to an ad hoc committee to be appointed by the President.

The Richard H Shryock Medal Committee (John C Burnham, Chairman) recommended, and the Council approved, that the medal be awarded to Jack D Pressman, a student at the University of Pennsylvania, for his essay entitled "Sufficient Promise John F Fulton and the Development of Psychosurgery"

The President thanked and commended Jeanne L Brand and her ad hoc Committee on Meetings for the work it had done and the comprehensive report and guidelines it had approved. The Committee was continued for up to one more year so that the report may be completed.

The Committee recommended and the Council supported a ban on smoking in scholarly sessions of the Association

The Membership Committee (Philip Cash, Chairman) plans, with the cooperation of the Johns Hopkins University Press, to contact individual subscribers to the *Bulletin* who are not now members of the AAHM to let them know the additional benefits and small extra cost of being Association members

It was voted to resume making a donation to the National Coordinating Committee for the Promotion of History A gift of $500 is to be given annually

The President reported that negotiations with the Johns Hopkins University Press are in progress regarding future Sigerist Supplements and the best way for the Association's Editorial Committee, the *Bulletin*'s editor, and the JHU Press to work together. A further report will be made to Councillors and published in the *Newsletter*

The President appointed an ad hoc Committee to review the by-laws and to bring recommendations to the Council in 1986. Committee members include Jeanne Brand, Saul Jarcho and Edward C Atwater (Chairman) with James Cassedy as advisor to the Committee

The Council accepted an invitation to hold the 1989 annual meeting in Birmingham, Alabama A proposal was made and discussed to hold meetings from Thursday through Sunday, rather than Wednesday through Saturday as at present, because of cheaper airfares and hotel rates Local Arrangements Committees were given the choice of options.

The President will discuss with the editor of the *Bulletin* the possibility of publishing in the *Bulletin* the Numbers-Carmichael Survey of United States Graduate Programs in the History of Medicine. He also reported that the Society for Health and Human Values, and the American Association for the History of Nursing seek a closer relationship with the AAHM

The Chairman of the 1986 Program Committee is to be Peter C. English of Duke Medical Center

The President, on behalf of the Association, expressed thanks to the outgoing members of the Council.

The meeting was adjourned at 10:15 p m

Edward C Atwater
Secretary-Treasurer

MINUTES OF THE ANNUAL BUSINESS MEETING OF THE AMERICAN ASSOCIATION FOR THE HISTORY OF MEDICINE, INC.

17 May 1985

The annual business meeting of the American Association for the History of Medicine, Inc. was called to order by the President, Robert P. Hudson, in Reynolds Hall at the Bryan Center, Duke University, Durham, North Carolina, at 4 05 p.m on 17 May 1985. Edward C Atwater served as Secretary About ninety members were present

The minutes of the 1984 meeting were approved as published in the *Bulletin.*

The Secretary read the names of members who had died since the last meeting They were as follows.

Truman G Blocker, Jr., Galveston, Texas
Charles W. Bodemer, Seattle, Washington
Nicholas Dietz, Jr , Omaha, Nebraska

Warren R Howell, San Francisco, California
S A Kaufman, Newton Center, Massachusetts
Abraham M Lilienfeld, Baltimore, Maryland
Lawrence C McHenry, Jr , Winston-Salem, North Carolina
Harold Schwartz, Lakewood, California

The members present rose for a moment of silence

The Secretary reported that there were 1,203 active members and thirty-two constituent societies in the Association as of 31 October 1984

A summary of Council discussions and actions from the meeting of 15 May 1985 included: (a) Consideration of the question of holding annual meetings from Thursday through Sunday; (b) A vote in favor of resuming a $500 per year contribution to the National Coordinating Committee for the Promotion of History; (c) Confirmation of the selection of Gerald Grob as the Garrison Lecturer for 1986, (d) Confirmation of the appointment of a committee by the President to review and make recommendations for updating the by-laws The committee includes Jeanne Brand, Saul Jarcho, Edward C Atwater (Chairman), and James Cassedy (ex officio) The committee is to present its report in 1986 and it will be voted upon at the 1987 meeting, (e) Acceptance of an invitation from Birmingham, Alabama, for that city to be the site of the 1989 meeting.

The Treasurer reported an income of $39,670 for the fiscal year 1983–84 and expenditures of $47,030, with a deficit of $7,360 [See financial statement that follows] Assets of the Association on 1 November 1983 were $50,281, on 31 October 1984, $42,921. Of this, $38,757.04 is endowment.* Gifts of $1,500 from the John P. McGovern Foundation and $110 from Neale Watson were gratefully acknowledged

With operating costs of about $32 per active member per year and income of about $26 50 per active member per year, the Treasurer recommended, the Council supported, and the membership passed unanimously the following dues structure to be effective for 1986.

Regular membership	$35
Family membership	45
Student membership	12
Constituent Society	50
Additional postage for *Bulletin,* at cost:	
Overseas	$5.00
Canada and Mexico	2 75

The recommendation of the Meetings Committee (Jeanne Brand, Chairman), supported by the Council, to prohibit smoking at all scholarly sessions of the Association was unanimously endorsed by the members.

The report of the Nominating Committee (Peter Olch, Chairman; John Norris, presenting), was read Four members were elected to the Council for three-year terms: Toby Gelfand, K Garth Huston, Janet K Kubinec and Patricia Spain Ward. These nominations were unanimously accepted as was the re-election of Edward C Atwater as Secretary-Treasurer for a two-year term

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* The Auditing Committee (W Bruce Fye, Genevieve Miller) reported later by letter that the books were in order

The Association's representative to the International Society for the History of Medicine, Dora Weiner, reported that future sessions of that Society would be held in both French and English and that the thirtieth Congress would be held in Düsseldorf, 31 August–7 September 1986

New business: (a) Members were urged to write to the Postal Service in support of a postage stamp in commemoration of William Beaumont, (b) The suggestion of Robert C Powell that optional contributions by members be accepted to subsidize student travel to AAHM meetings was referred to the Council; and (c) The desirability of having a meeting of the ISHM in the United States was discussed

Leonard Wilson moved, with the enthusiastic support of those present, that thanks and praise go to G. S. T. Cavanagh and all members of the Local Arrangements Committee for a hospitable, agreeable and meticulously executed meeting. Similar sentiments were accorded Todd Savitt and his Program Committee

The meeting was adjourned at 4 43 p m

Edward C. Atwater
Secretary-Treasurer

AMERICAN ASSOCIATION FOR THE HISTORY OF MEDICINE, INC.

Financial Report on the Fiscal Year 1983–84 Ending 31 October 1984

Classified Statement of Receipts and Expenditures
1 November 1983–31 October 1984

General Fund

RECEIPTS

Dues		
Active Members (all categories)	$30,020	
Constituent Societies	1,120	
International Society for the History of Medicine	1,230	
		$32,370 00
Sale of Publications		
Mailing List	350	
Research in Progress and Other Publications	69	
		419 00
Contributions		
John P McGovern Foundation	1,500	
Neale Watson	110	
		1,610.00
Refunds		
Rochester Postmaster	350	
Cancellation of lost check	17 10	
Toward Garrison lecturer (1984) ticket	361	
Johns Hopkins University Press	42	
		770 10
Interest		
Savings and Certificates of Deposit		4,488 22
Loan (Lincoln First Bank)		2,000.00
	1983/84 Total Receipts	$41,657 32

DISBURSEMENTS

Subscriptions to *Bull Hist Med*		$22,911 75
Foreign postage		143 00
Refunds for overpaid dues		49.36
Publications:		
Newsletter	1,729.48	
Research in Progress	0	
Membership Directory	654.82	
Smith-Budd Supplement	5,000 00	
ISHM By-Laws	38 80	
		7,423 10
Annual Meeting Costs.		
1984 San Francisco (including distribution of program)	4,144 80	
1985 Durham advance	500 00	
Call for Papers	21.40	
		4,666 20

Honors and Awards:		
Osler Medal	555.33	
Welch Medal	505.34	
Shryock Medal (including ten medals)	4,411.78	
Garrison Lecture (including portion repaid)	1,560.00	
		7,032.45
Administrative Costs:		
Subscription Service (including ISHM)	2,648.00	
Office Expenses	305.47	
Bank Charges	38.26	
Loan Interest	55.99	
Accountant Services	500.00	
New York State Fee	10.00	
Other	24.00	
		3,582.32
Transfer of Funds:		
ISHM dues		1,210.00
	1983/84 Total Disbursements	$47,018.18

BALANCE SHEET, 1983–84

Assets 1 November 1983		$50,281.47
Receipts		41,657.32
		$91,938.79
Expenditures		47,018.18
	Balance 31 October 1984	$44,920.61

TOTAL ASSETS 31 October 1984

Endowment Fund Balance	$38,757.04*
General Fund Balance	6,163.57

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*All interest accrued each year and the McGovern gift is assigned to the Endowment Account. From this, $3,000 is transferred annually to the Publication Fund

MEDICO-HISTORICAL NEWS AND ACTIVITIES

CORRESPONDENCE AND REPORTS

CHARLES W. BODEMER (1927–1985)

Charles W. Bodemer, Professor and Chairman, Department of Biomedical History, University of Washington School of Medicine, died suddenly on 3 February 1985. He was fifty-eight.

Chuck Bodemer was a native Californian, born 4 January 1927, and received his early schooling in the public schools of that state. His college experiences included Yen Ching University, Peking, China, City College of San Francisco and the University of California, Berkeley, prior to graduating from Pomona College with a B.A. in zoology (magnum cum laude) in 1951. I came to know him as a fellow student at Pomona in freshman zoology and comparative anatomy, though as a veteran of World War II, (U.S. Marine Corps, 1944–47) he lived off campus away from the high spirits of the younger students. Although he received a Ph.D. in anatomy from Cornell University in 1956 and always enjoyed research trips abroad, he was a confirmed Westerner. For many years, we shared a mutual love for that area of the United States.

In 1956, Chuck joined the faculty of the University of Washington School of Medicine as an instructor in anatomy. He rose in the ranks of the Department of Anatomy and applied his many talents more widely as Assistant Dean and Associate Dean of the School of Medicine (1963–67). His numerous interests led to his appointment in 1961 as head of a division of biomedical history. In 1967, this evolved into a Department of Biomedical History of which he was Chairman. In this capacity, he taught medical students and undergraduates. He was frequently called on to address house staff and faculty groups, and professional societies. He also participated in continuing medical education courses throughout the Pacific Northwest. His principal attribute as a teacher was, I believe, his ability to interpret medical history and ethical issues to the practicing physician in grand rounds, society meetings, and CME courses. I know of few medical historians, in fact, who have the ability he had to *communicate* with the medical profession.

Chuck's historical interests were widespread, but a review of his publications and lectures indicates that the history of anatomy and embryology, the history of surgery, the history of mental illness and psychiatry, and the history of early medicine on the Pacific Northwest frontier were his special interests. He was also the author of a

Bull. Hist. Med., 1985, 59: 405–414

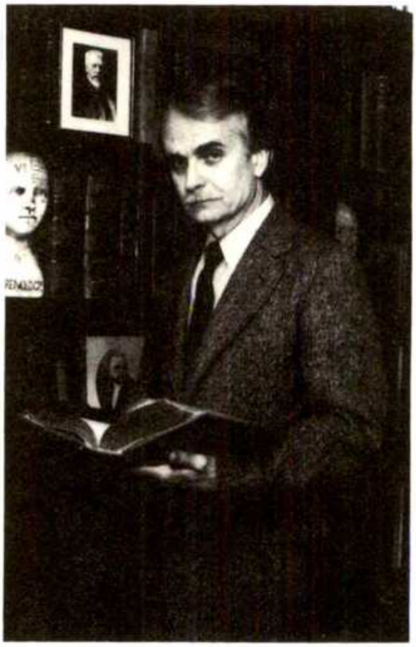
textbook on embryology which appeared in a Russian edition in 1971. He served on the Council of the American Association for the History of Medicine from 1965 to 1967 and was Secretary-Treasurer of the Association from 1967 to 1971. He was a member of the History of Life Sciences Study Section of the NIH from 1966 to 1970 and was on the editorial board of *Episteme* from 1967 until his death.

After the mid-seventies, Chuck devoted himself more and more to professional and community matters in the Pacific Northwest. He was active in the Urban League and the Model Cities Programs and one of his special concerns was to interest minority students in careers in the health sciences.

Chuck was an eloquent speaker, a lover of Gauloises and cognac, and, as his friends well know, he was blessed with an irrepressible sense of humor. He was also a very private person. I only found out recently that he had learned to read and speak Chinese. Although he was a good conversationalist, he appreciated solitude and from the front porch of his magnificent home in North Bend, Washington, he loved to watch the eagles soar and the deer graze. His death is a loss to the history of medicine.

PETER D. OLCH

LAWRENCE CHESTER McHENRY, JR. (1929–1985)



Lawrence Chester McHenry, Jr., Professor of Neurology, Bowman Gray School of Medicine, died 22 February 1985 in Winston-Salem, North Carolina. He was a month short of his fifty-sixth birthday. At the time of his death, he was a nominee for the Council of the American Association for the History of Medicine.

Larry McHenry was born in Oklahoma City on 20 March 1929. His early education included a period at the New Mexico Military Institute from which he graduated to enter Pomona College in Claremont, California, in 1947 as a pre-medical student. Our close friendship began at that time. (Interestingly enough, Charles Bodemer was in the same class and as a zoology major was enrolled in a number of the same courses.) McHenry had the knack of combining good scholarship and a full social life throughout college where he was known as "The Toad," from the character in the *Wind in the Willows*. He was the envy of a number of us who could not keep up with him in either sphere—academic or social.

Upon graduation in 1951, Mac enrolled in the University of Oklahoma School of Medicine, receiving his M.D. in 1955. His internship and residency were spent in internal medicine and neurology at the Boston City Hospital and the New England

Center Hospital from 1955 to 1960. He then entered the Armed Services and as Captain, MC, USAR, was stationed in the Department of Neurosurgery, Division of Neuropsychiatry, Walter Reed Army Institute of Research, where he conducted research on cerebral hemo-dynamics and developed the krypton-85 desaturation method for the determination of cerebral blood flow. This was reported in *Nature* in 1963. In 1964, McHenry left the service and moved to Philadelphia and was successively Assistant, then Associate Professor of Neurology at Jefferson Medical College, and Associate Professor of Neurology at the University of Pennsylvania General Hospital. In 1972, he moved to the Bowman Gray School of Medicine in Winston-Salem, North Carolina, as a Professor in the Department of Neurology and to continue his cerebrovascular research.

Mac first became interested in the history of medicine while a medical student. In fact, I can remember teasing him at that time and telling him that history of medicine was for old men! He was greatly influenced by Dr. Lewis Moorman of Oklahoma City and while overseas one summer made a point of visiting Henry Sigerist in Switzerland shortly before the latter's death. Mac's historical interests were in the history of neurology coupled with an interest in the medical problems of Dr. Samuel Johnson. His contributions to the history of neurology were numerous and included the updating and re-publishing of Fielding Garrison's *History of Neurology* in 1969.

McHenry received recognition for his scientific and historical work, first as a John and Mary Markle scholar in academic medicine, then as Chairman of the Philadelphia Neurological Society, President-elect of the American Osler Society, Historian and Archivist for the American Neurological Association, and as a lifetime member of the exclusive Johnson Society which limits its world membership to fifty. He had been chosen to address the British Neurological Association on Hughlings Jackson in the fall of 1985.

His accomplishments were achieved in spite of a battle with alcohol and drugs. The conquering of these problems led to the return of his youthful vigor and sparkle in later years. McHenry was a complex character. He leaves behind him the memory of a superb neurologist, an excellent historian, and a quiet and gentle person who has left his mark on patients, students, colleagues, and friends. He will be missed.

PETER D. OLCH

INTERNATIONAL CONGRESS OF THE HISTORY OF MEDICINE, CAIRO, EGYPT

The twenty-ninth International Congress of the History of Medicine met in Cairo, Egypt, 26 December 1984–1 January 1985. Jointly sponsored by the International Society for the History of Medicine and the Egyptian Society of Medical History, the various sessions were held at the Cairo Marriott Hotel with the participation of numerous members, including a contingent from the United States. As is customary, the Congress was organized around three themes—Egyptian medicine until the third century A.D., Islamic medicine and the relations between East and West, and parasitic and infectious diseases—together with the usual miscellaneous category.

In addition to the scientific program, the Organizing Committee, headed by Professor Paul Ghalioungui, scheduled a number of social events that allowed participants to visit the Egyptian Museum as well as the Salah El-Din citadel and mosques. On the final day, members were invited to visit the Suez Canal University in Ismailiya

After a reception given by the president of the University, two medical students presented papers on the local teaching of medical history. A brief tour of the Canal and the Bitter Lakes followed

United States members of the International Society for the History of Medicine will be interested in knowing that both the General Assembly and Administrative Council of the organization approved the new by-laws and elected Professor Hans Schadewaldt, director of the Institute for the History of Medicine, University of Düsseldorf, president for the next term G R Paterson from the Hannah Institute for the History of Medicine, Toronto, became the new treasurer The next meeting will take place 31 August–5 September 1986, in Düsseldorf, West Germany

GUENTER B. RISSE

ANNOUNCEMENTS

AMERICAN ASSOCIATION FOR THE HISTORY OF MEDICINE

Call for Papers, 1986 Annual Meeting

The 1986 annual meeting will be held in Rochester, New York, 30 April–3 May Any person interested in presenting a paper at the meeting is invited to submit an abstract (*original and five copies*) of approximately 300 words typed on a single page to the Chairman of the Program Committee Dr Peter C English, P.O. Box 3420, Duke University Medical Center, Durham, North Carolina 27710, to be *postmarked by 1 November 1985.* Please also include a one-page curriculum vitae (*six copies*) with mailing address, phone number, and information on occupation, degrees held, and institutional affiliation. Applicants may also submit a page describing a larger project of which a paper is a part (optional, also six copies)

The Program Committee will consider proposals for entire sessions (three papers), but will judge and accept each abstract on its own merits.

This year's program will once again include lunchtime roundtable workshops The Committee invites those interested in leading such workshops to submit a proposal outlining the session Please include a one-page curriculum vitae similar to that for paper submissions

Papers may deal with any aspect of medical history but should *not* represent work that has been published or is in press Presentation will be strictly limited to a time of twenty minutes, but may be followed by a discussion period at the discretion of the session chairperson. Participants are reminded that the *Bulletin of the History of Medicine,* the official organ of the Association, has the first right to consider for publication any paper delivered at the meeting

Committee Chairmen—1985–86

Editorial Committee—Kenneth Ludmerer
Education Committee—David Musto
Garrison Lecture Committee—Charles Roland
Loeb Library Committee—John Scarborough
Meetings Committee—Jeanne Brand
Membership Committee—Philip Cash
NLM Translation and Publication Program Committee—Saul Jarcho
Nominating Committee—Peter Olch

Osler Medal Committee—Ynez O'Neill
Program Committee—Peter English
Shryock Medal Committee—Daniel Fox
Welch Medal Committee—Gert Brieger

NATIONAL NEWS

Albert Einstein Medical Center Archives. Access is now possible to many of the institutional records of the Albert Einstein Medical Center. The bulk of the collection (it extends to over forty linear feet) concerns Jewish Hospital, Philadelphia, one of the oldest such institutions in the country, founded in 1865 Materials on Mt. Sinai-Daroff (1900–present) and Northern Liberties (1925–58) hospitals, which, with Jewish Hospital, consolidated to form Albert Einstein Medical Center, are also available. The archives will also include records of affiliate institutions. Willowcrest-Bamberger (1923–present) and Philadelphia Psychiatric Center (1937–present). Materials include annual reports, minutes, clipping files, photographs, newsletters, yearbooks, scrapbooks, physicians' files, and the papers of Moses Behrend (attending surgeon, 1913–48) For more information, write to the Archivist, Development Office, Albert Einstein Medical Center, York and Tabor Roads, Philadelphia, Pennsylvania 19141.

American Institute of the History of Pharmacy Awards. The Institute has bestowed its 1985 Teaching Improvement Award on W Clarke Ridgway, clinical instructor and assistant director of prescription pharmacy services at the West Virginia University School of Pharmacy Mr Ridgway will use the matching grant to study the history of pharmacy at the University of Wisconsin-Madison in preparation for teaching a history of pharmacy course at his home university

The Institute has issued certificates of commendation for notable contributions in the local and regional history of pharmacy to Robert W Morrison, professor emeritus of the University of South Carolina College of Pharmacy for *The History of Pharmaceutical Education at the University of South Carolina, 1865–1978,* of which he was primary author, and to Kenneth Redman, professor at the South Dakota State University School of Pharmacy, for his history of that school.

Grants-in-aid for thesis research have been awarded to doctoral candidates David P. Adams of the University of Florida and Ronald C Sawyer of the University of Wisconsin.

Antique Medical Instruments. Collectors may be interested in obtaining a publication of the Sotheby Parke Bernet galleries entitled *Antique Medical Instruments* (available from I. Freeman, 12 East 52nd Street, New York, New York 10022 at $65 00). Written by Elisabeth Bennion, a dealer in antiques associated with I Freeman of London and New York, the book covers the history of medical and surgical instruments from the Middle Ages to 1870 A directory of surgical instrument makers gives a framework for dating pieces by named makers Her next book, on antique dental instruments, will be published by Sotheby's in 1985–86

Baltimore. Robert J T. Joy of the Uniformed Services University School of Medicine addressed the Baltimore City Medical Society on 2 May 1985 His topic was "Civil War Medicine"

Literature and Medicine. This annual, which explores the connections between literature and medicine, and will be edited by Anne Hudson Jones of the Institute for the Medical Humanities at the University of Texas Medical Branch, Galveston, Texas 77550 is now being published by the Johns Hopkins University Press It first appeared in 1982. Previous volumes have centered on the following themes: "Towards a New Discipline," "Images of Healers," and "The Physician as Writer" This year's volume (to be published in the fall) focuses on psychiatry and literature For subscription information, please write to The Johns Hopkins University Press, Journals Division, 701 West 40th Street, Suite 275, Baltimore, Maryland 21211

National Library of Medicine. On 3 June 1985, the History of Medicine Division heard a historical lecture on "Physiology and the Kuhnian Hypothesis—Evolution or Revolution?" The lecture was given by Thomas S Hall of Washington University, NLM Visiting Historical Scholar for the 1984–85 academic year

University of Virginia. A rare book presentation was made by William Bennett Bean to the Claude Moore Health Sciences Library on 11 May 1985 in the Wilhelm Moll Medical History Room

PROGRAMS OF MEETINGS

Medical History Club of Ottawa

September 15, 1984. "Osler's Last Days· A Doctor's Diary," Philip Teigen

October 19, 1984. "The Founding Fathers of the Canadian Medical Association," Arthur Peart

November 9, 1984: "The First Medical Textbook An Introduction to Egyptology," Harold Fireman

January 9, 1985: "H. Benge Atlee· A Canadian Pioneer in Obstetrics and Gynecology," Harry Oxorn

January 25, 1985. "Abraham Flexner and the Rockefeller Foundation," Egils Liepa

March 22, 1985 "The Fever Ships, Grosse Ile and George Douglas," Ted Mullens

Medical History Society of New Jersey, Lawrenceville

May 8, 1985 "Will the Real Abraham Flexner Please Step Forward?" Charles Vevier; "A Century and a Half of Trichinosis," William C Campbell; and "Family Practice. Ancient and Modern," Gert H Brieger (The Sixth Annual Morris H Saffron Lecture)

Tulane History of Medicine Society, New Orleans

September 4, 1984· " 'Ask Not' International Medicine and Kennedy's Peace Corps," James Banta

September 20, 1984· "Medicine in the Antebellum South," John Duffy

October 4, 1984 "A Centennial· The Isolation of Cholera, 1884," Ronald J. Seibeling

October 15, 1984· "Those Amazing Men and Their Anesthesia Machines," Rod Calverly

October 17, 1984 "Early California Women Physicians," Selma Harrison Calmes

November 6, 1984 "Of Flies, Fictions, and Nervous Afflictions. The Founding of American Neurology," Bruce Schoenberg

March 19, 1985. "Rudolph Matas His Contributions to Anesthesia," Wallace K Tomlinson

April 9, 1985. "This History of Hypertension," Edward Frohlich

April 23, 1985 "The Beginning of the Birth Control Movement in Nineteenth-Century England," Patricia Bailey, "The Leviathan The Rise of Capitalist Organization in American Medicine," Michael Borowitz, "The Life and Contributions of Dr George Papanicolaou," Gordon D. Honda, "The Physician and International Law: Medical Aspects of the Geneva Conventions," Scott Norton; and "Rudolph Matas and Yellow Fever," C Robert Wetzel

April 27, 1985 "Modern Medicine Goes to War. 1917," Robert J T. Joy (Annual B. Bernard Weinstein Lecture)

April 30, 1985 "The History of Coronary Artery Disease and Myocardial Revascularization," Lyman Brewer

Washington Society for the History of Medicine, Bethesda, Maryland

May 11, 1985 "Family Practice Ancient and Modern," Gert H. Brieger

NEWS FROM ABROAD

Canada. Members of the Canadian Society for the History of Medicine met at the Université de Montréal from 31 May–1 June 1985 for their annual conference Twenty-four papers were presented on a variety of subjects ranging from Canadian topics to medicine in Moorish Spain The meeting was supported by the Science and Humanities Research Council of Canada

England. An international conference on problems and methods in the history of medicine was held at Corpus Christi College, Cambridge, 25–28 March 1985 Papers presented were: "Methodological Problems in Modern Urban History Writing Twenty Presentations of Urban Mortality, 1750–1850," Arthur Imhof (Free University of Berlin); "The Physical State of the British Working Class, 1860–1914 Evidence from Army Recruits," R. Floud (University of London); "Twenty Years Later Problems of Historical Method in Public Health," J-P Goubert (Ecole des Hautes Etudes des Sciences Sociales, Paris); "Medical Education at Montpellier and the Medicalisation of French Society," C Jones (University of Exeter), "Interfaces? Perceptions of Health and Illness in Seventeenth-Century England, Traditional History, the *Annales* and Demographic History," Andrew Wear (University of Aberdeen); "Popular Culture and the Knowledge of the Body. Infancy and the Medical Anthropologist," F. Loux (Centre d'Ethnologie Française, Paris); "Hospital History New Sources and Methods," Guenter Risse (University of Wisconsin), "Quantitative and Qualitative Aspects of the Asylum. A Case Study of the Retreat, 1796–1910," A. Digby (University of York), "The *Annales* and Medical Historiography *Bilan et Perspectives,*" Toby Gelfand (University of Ottawa); "Madness, Suicide, and the Computer," Michael MacDonald (University of Wisconsin); "Medicine in Civil Engineering and in the Environment," A. Guillerme (Ecole Nationale des Travaux Publics de l'Etat); and "Setting Bounds to Mortality Levels in the Past," E. A. Wrigley (Cambridge Group for the History of Population and Social Structure).

International Conference on the History of Arab-Islamic Health Sciences—Call for Papers. The Faculty of Public Health and Allied Health Sciences of the Yarmouk University, Irbid, Jordan, will be sponsoring its first International Conference on the History of Arab-Islamic Health Sciences on 4–8 October 1986 to coincide with the 700th anniversary of the Arab pioneer of public health, therapist-surgeon Abū'l-Faraj ibn al-Quff al-Karakī (1233–89) An invitation is extended to all health professionals and historians interested in the fields of history and philosophy of public health, medicine, pharmacy and the allied health sciences to participate. All papers will be given in English and abstracts of no less than 400 words are requested, preferably before *30 November 1985*. Completed papers must be received no later than 30 June 1986 to meet publication deadlines. To submit abstracts or for further information on the conference, write to Professor Sami K. Hamarneh, Faculty of Public Health, Yarmouk University, Irbid, Jordan.

Italy. The thirty-second national congress of the Societa Italiana di Storia della Medicina takes place on 19–21 September 1985, under the sponsorship of the University of Padua. Sessions are being held at Padua and Trieste and papers presented on three themes—Padova e la medicina europea, A novant'anni dalla scoperta di W C Röntgen· la diffusione della radiologia in Italia, and Rapporti tra la Scuola medica di Vienna, Trieste e il Lombardo-Veneto

The Netherlands A symposium on "Matter and Force: The Introduction of Modern Thought on Natural Science in Medicine, as Shown in Medical Journals of the Netherlands, 1840–1870" is being held at the Catholic University in Nijmegen on 21 September 1985 M. J. van Lieburg will open the symposium speaking on "Scientific Medicine in Medical Journals of the Netherlands, 1840–1870." Other speakers are. A. de Knecht-van Eekelen, "Changes in Physiology"; F N Groustra, "Circulation and Respiration", Harm Beukers, "Physiological Chemistry", G T. Haneveld, "Changes in Pathology", A. M. Uyterlinde, "Inflammation"; Daniel de Moulin, "Cancer"; P. H M Schillings, "Tuberculosis"; and R. H. J. ter Meulen, "Neuropsychiatry." All papers are to be given in Dutch

Society for the Social History of Medicine, Great Britain. The Society's annual conference took place at the University of Edinburgh from 5–7 July 1985 The theme of the conference was "The Changing Face of Scottish Health and Medicine" and speakers included R. M. Mitchison, "Malnutrition A Theme for the Social Historian", F Rice, "Scotland's Museums of Madness: The Origins and Early Growth of an Organisation of Insanity in Scotland", M. Thompson, "The Mad, the Bad and the Sad. Inmates in the Royal Edinburgh Asylum, 1874–1894"; B White, "Medical Teaching and the Rise of the Professional Medical Officer of Health in Scotland"; F McManus, "The Miasmatic Theory and Public Health Administration in Edinburgh and Leith, 1830–1879", M. Barfoot, "Edinburgh's Infirmary in the Eighteenth Century The Birth of the Clinic?"; R. Stott, "Health and Virtue. Lectures on Pathology and Therapeutics by William Cullen, 1766–1773", Christopher Lawrence, "Medicine in the Scottish Enlightenment Stock-Taking Time?"; Stephanie Blackden, "Parochial Health Care in Late Nineteenth-Century Scotland"; U. Maclean, "The Usher Institute and the Development of Community Medicine", A. Holohan, "St Kilda. Emigrants and Disasters"; and K. Collins, "Jews in the Scottish Universities in the Age of Enlightenment."

Spain. The International Congress for the History of Pharmacy is being held at the University of Granada on 25–29 September 1985 and is organized by the Spanish Society for the History of Pharmacy and the Department of the History of Pharmacy of the university. Papers presented will include discussions of the social history of pharmacy and drugs, the history of scientific thought on the concept and application of drugs, the relationship between science and pharmacy in science, and varia. Among the highlights are to be an exhibition of rare books in the University's Central Library and a classical guitar recital

Switzerland. The Swiss Society of the History of Medicine and Natural Sciences will hold its annual meeting in Biel on 4–5 October 1985.

Wellcome Institute for the History of Medicine. The Institute sponsored a one-day symposium on "Degenerationism in Late Nineteenth-Century Thought" on 24 May 1985. The topics treated were "Alpheus Hyatt on the Emancipation of Women and Racial Senility," P. J. Bowler, "A Dream of Demon Heads and Savage Eyes. Italian Criminal Anthropology and the Spectres of History," Daniel Pick; "Glaucous and Mauve Decadence and Degeneration in the English 1890s," James McGeachie, "Nordau's *Degeneration* Autopsy or Prophecy?" Michael Neve, "Nietzsche· Genealogy and Decadence," Michael Tanner, and "Oswald Spengler and the Decline of the West," J. P. Stern.

NLM VISITING SCHOLARS PROGRAM

National Library of Medicine. The National Library of Medicine supports an annual program to bring recognized historical scholars to the Library's History of Medicine Division to engage in research, scholarly interchange, and staff consultation for a period of six to twelve months

The Library will select one individual for the 1986–87 NLM Visiting Historical Scholars Program. Applications are now being solicited from individuals who are United States citizens Applicants, who may be health professionals, historians, librarians, scientists, or other professionals, must have had extensive training and/or experience in medical history or a related field, together with a demonstrated record of productivity in pertinent historical scholarship of a high level Normally, only those who are at mid-career or senior levels will be considered, and awards will not be renewable. Applicants may apply to spend anywhere from six to twelve months as NLM Visiting Scholar during the period 1 September 1986 through 31 August 1987

The individual selected will be given financial remuneration commensurate with his or her current salary (not to exceed $67,940), and fringe benefits. In return, the scholar will be expected to devote himself or herself to a specific and well-defined research project which will focus explicitly on and extensively utilize NLM's collections The scholar will be expected to spend most of his or her time in residence at NLM, except for incidental trips for meetings or occasional collateral research. One public lecture and one historical staff seminar related to the individual's research will be required, and availability for consultation with NLM staff members will be expected. The scholar will also be asked to devote some time to a project, to be mutually agreed upon, that contributes to NLM's service mission, such as assessing the Library's historical collections and/or programs in his or her area of expertise

Completed applications must be received at the NLM on or before *1 February 1986* Application forms may be obtained from the Chief, History of Medicine Division, National Library of Medicine, 8600 Rockville Pike, Bethesda, Maryland 20209, Telephone· (301) 496-5405 ·

FELLOWSHIP OPPORTUNITIES

Johns Hopkins Institute of the History of Medicine. The Owsei Temkin fellowship and other fellowships for graduate study, either for the M.A. or the Ph.D. degree in the history of medicine, will be available 1 July 1986. Tuitions and stipends possible For further information, write to Dr Gert H Brieger, Director, Institute of the History of Medicine, The Johns Hopkins University, 1900 East Monument Street, Baltimore, Maryland 21205 Please include curriculum vitae and a statement of research interests Deadline for application· *15 February 1986*

Section on the History of Psychiatry, Cornell University. The Section on the History of Psychiatry of the Department of Psychiatry of Cornell University announces the commencement of the Eric T. Carlson Predoctoral Fellowship, established by the Mark Kanzer Fellowship Fund This predoctoral research fellowship is open to applicants who have completed their course work and who have a doctoral topic relating to the history of psychiatry, psychoanalysis, or the mental health field acceptable to the committee The fellowship will provide a one-year stipend (renewable on review for two more yearly terms) plus funds for travel and research expenses The Fellow would be expected to participate in the activities of the Section (a fortnightly research seminar, presenting work in progress, offering electives to medical students and psychiatric residents, etc) In addition, an essential part of the experience will be participation in selected portions of the Department's psychiatric teaching and training program to enhance understanding of current issues relating to the doctoral dissertation topic. Other resources available include the Oskar Diethelm Historical Library, the History of Psychiatry Reference Library, and the Archives of Psychiatry Address applications and enquiries to The Eric T Carlson Fellowship Committee, Department of Psychiatry/P-900, New York Hospital-Cornell Medical Center, 525 East 68th Street, New York, New York 10021

JOB OPPORTUNITY

Applications are invited for a three-year term appointment as Assistant Professor in the Section of the History of Medicine at the Yale University School of Medicine to begin 1 July 1986 or earlier A Ph.D in history of medicine, or in history of science with experience in history of life sciences relevant to medicine, is expected Within these areas, preference may be given to a candidate whose areas of interest complement those of the present faculty. The person appointed will participate in the development of the Ph D program in the history of medicine and the life sciences, and may do additional teaching within the medical school or in Yale College The deadline for applications is *15 October 1985*. Applications and enquiries should be addressed to Professor Frederic L. Holmes, History of Medicine, Yale University, P O Box 3333 Yale Station, New Haven, Connecticut 06510 Yale University is an equal opportunity, affirmative action employer, and specifically invites applications from women and minority candidates

BOOK REVIEWS

OF THE WRITING OF HOSPITAL HISTORIES THERE IS NO END

JOHN R. GUY

An Essay Review

STANLEY BATEY ***An Early Welfare Society: The Public Dispensary of 1804, Wiveliscombe.*** Wiveliscombe. Wiveliscombe Historical Society, 1980 (Wiveliscombe Historical Society Publication, no 2). 14 pp

JOY BURDEN ***Butleigh Hospital: The First 100 Years.*** Butleigh League of Friends, 1984 55 pp Ill

ADRIAN CORDER-BIRCH ***A Centenary History of Halstead Hospital, 1884–1984.*** Halstead Halstead and District Local History Society, 1984 78 pp. Ill. £1 95

BENJAMIN G COX. ***The Hospital and Chapel of St. Leonard, Blandford Forum.*** Blandford Blandford Local History Society, 1983 (Blandford Local History Monograph, no 2) n p. Ill.

RONALD K. HUCH ***From Blacksmith Shop to Modern Hospital: The Story of St. Luke's in Duluth, 1881–1981.*** Duluth, Minn. BAH Books, 1983 112 pp Ill. $8 00

JOZE JANCAR. ***Research at Stoke Park: Mental Handicap, 1930–1980.*** Stapleton, Bristol: Stoke Park, 1981 (Stoke Park Studies Suppl) 70 pp. Ill.

STEPHEN P NUNN ***St. Giles' Leper Hospital, Maldon: Historical Research, including Dowsing Survey.*** Maldon: Maldon Archaeological Group, 1983. 5 pp Ill. 65p

F J PAYNE ***The Torbay Hospital, 1844–1980.*** Torbay, 1981 31 pp Ill.

C BRUCE PERRY ***The Voluntary Medical Institutions of Bristol.*** Bristol Bristol Branch of the Historical Association, 1984 (Local History Pamphlets, no. 56) 22 pp Ill. 90p.

"Only a comfortable unfamiliarity makes any group of individuals appear homogeneous Variety . . is their single most notable characteristic " That is the recent verdict of one historian on the clergy of the seventeenth-century English church[1] With only slight alteration, it could equally well refer to the smaller English provincial hospitals—variety is *their* single most notable characteristic, and any attempt to label them, though perhaps necessary and convenient for the historian, in the end is at least a partial failure. They are not homogeneous.

This is why the task of a reviewer of histories of several of them, published in recent years, is so difficult The writing of hospital histories is something of a "growth industry" at present, and those with which this discussion is concerned range from studies of two medieval institutions on opposite sides of England to that of a specialist hospital just over fifty years old, and from the story of nineteenth-century cottage hospitals to a discussion of the voluntary medical institutions of a large provincial city.

The authorship is equally diverse Among those who have applied themselves to the task are a psychiatrist, a retired professor of medicine, a hospital administrator, a bevy of local historians and archaeologists, and a pair of "professional" academic historians, one on each side of the Atlantic It is an interesting comment upon the difficulty of writing a satisfying—and satisfactory—hospital history that the works of the professionals are among the dullest, and the most stimulating of this particular "clutch" are those by the hospital administrator and a local historian, whose family has been closely connected with "her" hospital for many years The affection and sense of commitment is almost tangible, and yet their accounts are not lacking in objectivity.

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[1] Margaret Steig, *Laud's Laboratory* (Cramburv, NJ Bucknell University Press, 1982), p 48

Taking them in roughly chronological order, this group of recently published histories includes those of the Hospital and Chapel of St Leonard, Blandford Forum[2] and of St. Giles' Leper Hospital, Maldon.[3] Both are very slight works, doing no more than sketch in outline the story of these medieval foundations, Maldon circa 1164 and Blandford some time in the thirteenth century. They are obviously intended primarily to draw the attention of local people to the nature of the surviving remains—at Maldon in Essex a ruin on the outskirts of the town, at Blandford a barn. Both hospitals during their life had some features in common Although that at Maldon was founded by Henry II "for the relief of such burgesses of this town as should have the leprosy,"[4] by the late fourteenth century it had become little more than a chapel. A similar fate overtook St. Leonard's at Blandford, where the dedication may indicate that it too had been intended for "lepers," but which by the sixteenth century had become merely a chapel-of-ease to the parish church. The surviving remains of both hospitals are therefore what one might expect, those portions originally built, or subsequently used, as chapels.

If the histories of these hospitals have something in common, so too does their historians' handling of their material. Both Stephen Nunn (Maldon) and Benjamin Cox (Blandford) are victims of the kind of tunnel-vision which seems to afflict so many hospital historians In neither case is there any attempt to relate the story of the hospital to other similar and contemporary institutions, and neither gives an adequate explanation of the surviving tangible remains. The authors have not troubled to seek out what is known about "leper" hospitals in England, and apply it to their site It is, for example, known that these institutions usually consisted of groups of cottages surrounding the chapel (cf. Lanfranc's pre-1089 foundation at Harbledown, as illustrated in 1766)[5] and natural that the comparatively insubstantial dwellings should be the first to disappear, leaving only the more substantial chapel which had been the focus of the community as the only surviving building Neither Nunn nor Cox show any awareness of this.

The Wiveliscombe Infirmary and Public Dispensary, founded in 1804 by the able but eccentric Dr. Henry Sully, was for a time the only voluntary hospital between Bath and Exeter, though quickly overshadowed by larger institutions in the nearby Somerset towns of Taunton and Bridgwater. The hospital, however, did (just) manage to survive until the advent of the National Health Service in 1948 In his pamphlet, published for the local historical society,[6] Stanley Batey says that it is his intention "as far as possible to let the original documents speak for themselves, linking them together with the minimum of comment or description"[7]—an intention which he faithfully carries out Batey reprints the hospital's Rules for Admission, and those for the Lying-In Charity, which became associated with it in 1857. He also lists the donors and benefactors from 1808–80 (how antiquarians love lists!) and reproduces extracts from the report of the hospital's 67th Annual General Meeting in 1870, revealing that in that year the honorary medical officers had to hold Membership of the Royal College of Surgeons and the Licence of the Society of the Apothecaries The resident surgeon occupied the furnished Dispensary House free of rent, rates and taxes. The hospital buildings still survive, and the Dispensary House continues in 1985 to accommodate a medical practice.

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[2] Cox, *Hospital and Chapel of St Leonard, Blandford Forum*

[3] Nunn, *St Giles' Leper Hospital, Maldon*

[4] *Ibid*, p 1

[5] Illustrated in Plate 1(b) of Walter Hindes Godfrey, *The English Almshouse, with some Account of its Predecessor, the Medieval Hospital* (London Faber and Faber, 1955)

[6] Batey, *Early Welfare Society*

[7] *Ibid*, p 1

. Batey's pamphlet thus contains interesting snippets, giving a few glimpses into the working of this now forgotten institution. But it makes no pretence at being a connected narrative, and is not a history of the hospital. One such was published anonymously in 1948, and gives much fuller information.[8] The frustration of Batey's work is that it not only makes no reference to this earlier history, but gives no indication as to the current whereabouts of the records to which he refers—a serious omission, devaluing his effort

By contrast, F J Payne's study of Torbay Hospital[9] is intended as a narrative history of the hospital, founded in 1844. There is no attempt at analytical or interpretive writing, but nonetheless Payne, an administrator at Torbay, has produced a thoughtful study, presented in a chatty but quite stimulating style It is evident that he understands what he is writing about—benefactors are identified, background information on the names of wards and halls of residence is provided, the complexities of contributory schemes, subscriptions and the organization of the voluntary medical staff are clearly unravelled for his readers

Torbay is now a thriving District General Hospital, but like so many has grown from modest beginnings, greatly supported by local benefaction In 1925 the gift of £100,000 from Mrs. Ella Rowcroft enabled the hospital to be entirely rebuilt on a new site. (Payne, very properly, places Mrs. Rowcroft's portrait in the text at this point in the narrative) As an attempt to help local people understand more of "their" hospital, and take a pride in it, Payne's essay certainly succeeds

By contrast, Ronald K. Huch's book on St. Luke's Hospital in Duluth, does not[10] It is valuable in a general review such as this to be able to compare the published histories of provincial hospitals on opposite sides of the Atlantic and interesting to discover that both attract good, bad and indifferent writers. It has to be said at once that this is far from being one of the best It is an over-detailed study and very dully written, and Huch has been ill served by his printers, for the illustrations are poorly reproduced. Huch simply does not perform what he promises "I have tried to avoid an overbundance (sic) of names, dates and numbers" he writes in his introduction[11]—but the work contains an indigestible welter of them "I have tried to relate developments at St Luke's to the broader picture of hospitals in America" he says[12]—but in this patently fails He also entirely misses the significance of the decision of the St. Paul's Vestry in 1881 that as soon as sufficient funds could be procured, it intended to erect or buy a building "for the purpose of commencing and inaugurating St.

[8] *Wiveliscombe Dispensary and Infirmary, 1804* Copies of this now rare booklet are held at the Local History Library, Taunton Castle, Somerset, and in the Medical Library at Yeovil District Hospital

[9] Payne, *Torbay Hospital, 1844–1980*

[10] Huch, *From Blacksmith Shop to Modern Hospital*

[11] *Ibid*, p iii

[12] *Ibid*

Luke's Hospital of Duluth, Minnesota, *a charitable Cottage Hospital*"[13] Here was a golden opportunity to relate the plans and developments at Duluth to the "Cottage Hospital Movement" in England, which had got under way just over twenty years before, and as recent research has revealed, already reached the Eastern Seaboard of the U.S.A[14] Huch—presumably not realizing the implications of the Vestry minute—fails to grasp his opportunity For a professional historian, this is a sadly uncritical study

The same can be said of Adrian Corder-Birch's *Centenary History of Halstead Hospital* in Essex[15] Once again we are presented with an over-detailed and dully chronological piece of writing There is the all-too-familiar kaleidoscope of names, and blow-by-blow accounts of committees, donations and the like Corder-Birch shows little awareness of developments in medical and surgical care during the century of his hospital's existence, and fails to bring out the relationship of the hospital to the little town of Halstead, which is nowhere described. He does, however, give space to the provision of a brief general history of hospitals and the origin of Cottage Hospitals, thus placing Halstead in its national context[16] The work is evidently a labour of love by a local historian, but it succeeds no better in its object than Huch's much more extensive survey of Duluth

Contemporary with Halstead is Butleigh Hospital—another fruit of the Cottage Hospital Movement in England In many ways Halstead and Butleigh have a similar history—both founded in 1884, both strongly supported and generously endowed by local landowning families (at Halstead the Courtaulds, at Butleigh the Neville Grenvilles), both generating in Annual Reports, newspaper cuttings and committee minutes almost identical source material for the historian. Yet the contrast between Corder-Birch's handling of the Halstead corpus and Joy Burden's of Butleigh's[17] could not have been greater. Burden is anecdotal where Corder-Birch is chronological, lively where he is dull She also writes with imagination and humour, quoting for example from a patient who said "I've *never* heard of anyone running away from this place; most run to it!"[18] One section reconstructs a day in the life of the Resident Medical Officer in 1889, another is a flight of fancy where the ghost of "Sister Emily" (Matron 1889–1912) revisits the hospital in 1983 for a guided tour of her old domain "70 years on" Joy Burden's book is packed with personal reminiscences by staff and patients, and details of Governors, Trustees and Committees are relegated to appendices For anyone seeking to understand the spirit and philosophy of a rural English Cottage Hospital, Burden's work is to be preferred every time to that of Corder-Birch.

Stoke Park Hospital near Bristol is a specialist institution, founded in 1930 for research into mental handicap and the care of those who suffered from it, by a remarkable Church of England clergyman, the Rev. Harold Burden. Burden, whose ministry had included work in Canada among lumbermen and Indians, who had been chaplain of Horfield Prison and Master of the Barber's Company, founded "National Institutions for Persons requiring Care and Control," became the first

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[13] Quoted on p 4

[14] I am grateful to Dr Meyrick Emrys-Roberts, President of the Association of General Practitioner Hospitals, for this information Dr Emrvs-Roberts is currently completing a history of the Cottage Hospital Movement.

[15] Corder-Birch, *Centenary History of Halstead Hospital, 1884–1984*

[16] *Ibid*, pp 5–6

[17] Burden, *Butleigh Hospital The First 100 Years*

[18] *Ibid*, p 33

Warden of this Incorporation, and entirely financed it The story of Stoke Park is a remarkable one, told here by one of the psychiatric staff, Dr Joze Jancar, who has set it in the framework of chapters dealing with the work at the hospital of its successive directors, Burden, Professor R J A. Berry and Dr R. M. Norman[19] The author succeeds in avoiding the principal pitfall of this method, the production of what Kenneth Ludmerer recently called "little more than collective biography of anyone ever associated with the institution,"[20] by the provision of a valuable fourth chapter on "Research into the Causes, Treatment and Prevention of Mental Handicap" at Stoke Park. This chapter is divided into early years, 1930–48, 1948–80 and a succinct conclusion which relates the work to the earlier care of the mentally ill in the Bristol area Later, Jancar provides a very comprehensive list of books and papers published by members of the staff of Stoke Park throughout its history, the extent of which itself speaks eloquently in support of his claim that the "50 years of research at Stoke Park are packed with pioneering work in diagnosis, treatment and prevention of mental handicap."[21] This is a very stimulating little book to read

Finally, there is Emeritus Professor Bruce Perry's *Voluntary Medical Institutions of Bristol,* a survey of the hospitals, dispensaries and specialist institutions of this large English provincial city[22] In the compass of a modest twenty-two-page pamphlet it was clearly impossible for Perry to attempt any real analysis of the medical life of these institutions, varying from the Bristol Royal Infirmary (1736) to the Homeopathic Hospital (1852)—or how effectively they fulfilled their functions. He eschews this task and provides instead a non-critical canter through the story of their founding and funding. His bibliographical note shows that he has conscientiously referred to both published and archival material, and two of his conclusions are worth highlighting "Nearly always the foundation of these voluntary institutions was due to the drive and enthusiasm of one or two men It is true that they were usually able to gather together a group of collaborators, but without their initiative it appears that nothing would have been effected"[23] Secondly, Perry asserts, the ever-recurring problem of debt did not usually prevent the provision of improvements and extensions. "Once convinced of the desireability of such expenditure they did not hesitate to undertake it, confident that somehow or other funds would be provided by the public"[24] In this respect at least, the faith of the governors of the old voluntary institutions is in marked contrast to the philosophy of the present state medical service in Britain. Perry's pamphlet does provide a useful introduction to the medical institutions of Bristol, but the restrictions of the format prevent him from doing justice to his subject

Can any general conclusions be drawn from this survey of nine recently published works on hospitals in the English and American provinces? One is tempted to say that Kenneth Ludmerer's judgment is largely vindicated "Most are simply chronologies, devoid of explanation or interpretation"[25] He rightly maintains that the history of a hospital should delineate "the major forces shaping the development of the institution," but warns that "such an approach demands an awareness of developments in medical science and practice, the growth of other professional groups, public attitudes toward the medical profession and toward disease, the movements in social welfare and social reform, the changing responsibility of government, the role of philanthropy, and events particular to the community under consideration."[26] It is his sad conclusion that "few hospital histories have been written with these issues in mind."[27] The nine short studies examined here would not, it would seem at first, result in him having to change his mind, and his verdict.

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[19] Jancar, *Research at Stoke Park Mental Handicap, 1930–1980*

[20] Kenneth M Ludmerer, essay review, "Writing the history of hospitals," *Bull Hist Med*, 1982, *56* 107

[21] Jancar, *Research at Stoke Park Mental Handicap, 1930–1980,* pp 36–37

[22] Perry, *Voluntary Medical Institutions of Bristol*

[23] *Ibid*, p 19

[24] *Ibid*, p 20

[25] Ludmerer, "Writing the history of hospitals," p 107

However—and this is an important caveat—we must be mindful of the audience for which these pamphlets and booklets are intended. In general, they are an attempt to heighten the awareness of local—lay—people, mildly interested in the history of their locality, by drawing out for them the significance of certain buildings in their community. Few of the authors were setting out to make a contribution to the "history of medicine" and they would be the first to admit that they were not competent to do so. Further, the limited financial resources available to local history societies, hospital Leagues of Friends or the authors themselves—the usual publishers of these works, means that in a number of cases the narrative has had to be "pared to the bone" and much information—to the authors' regret no doubt—omitted. Ludmerer was speaking of hospital studies of a hundred or more pages. Of the nine reviewed here only Huch's work on Duluth comes into that category. So it is necessary to temper his judgment—in its context perfectly valid—with some mercy, by asking the question, "do these works succeed within their own limited compass?" From the foregoing analysis, the answer must be that some do—notably Payne, Burden and Jancar. Others, in particular Huch and Corder-Birch, do not—whatever the limitations there is no excuse for pedestrian writing. There is also a third group containing Nunn's, Cox's and Batey's work all of which is too slight to have any real value at all.

Perry's pamphlet cannot be categorized—and that succeeds in returning us to our starting point. Variety is the single most notable characteristic not only of hospitals, but of hospital historians and the work they produce. The fact that about one in three authors succeed in their endeavor should be seen as an encouragement for others to take up the challenge, and not as a deterrent. No one group of writers and researchers can be guaranteed to produce better results than another, and in the writing of hospital histories the laurels do not always, it would seem, go to the "professional academic."

Galen: On Respiration and the Arteries. Translated and edited by DAVID J. FURLEY and J. S. WILKIE. Princeton, N.J.: Princeton University Press, 1984. vi + 289 pp. $30.00.

In the early 1960s the late J. S. Wilkie prepared for his own use in teaching at University College London translations of Galen's four short works on respiration and cardiovascular function: *De usu respirationis* (On the use of breathing), *An in arteriis natura sanguis contineatur* (Whether blood is naturally contained in the arteries), *De usu pulsuum* (On the use of the pulse), and *De causis respirationis* (On the causes of respiration), which together present a cross-section of Galen's views on the function of the heart, lungs, arteries, and veins. After their appearance in printed Latin editions in the early sixteenth century, the four works had influenced the physiological thinking of anatomists, not the least of whom was William Harvey. As Wilkie notes in his introduction to the present translation (pp. 45–46), Harvey in the *De motu cordis* wrote that all anatomists have agreed with Galen that the pulse and respiration served the same purpose and differed only in that respiration depended on the animal faculty, whereas the pulse depended on the vital faculty, in words that are a direct quotation from the concluding passage of Galen's *De usu pulsuum*. "breathing and the pulse differ in only one way, in that the one is moved by the psychic power and the other by the vital power" (p 227). Because of the importance of the four texts to the history of physiology, Wilkie sought the collaboration of a Greek scholar, David J Furley, then at University College London, but since 1966 at Princeton University, to prepare a critical edition of the Greek text together with an English translation The result is the present volume, which was in press at the time of Wilkie's death in 1982

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[26] *Ibid.*

[27] *Ibid.*

In editing the Greek text of *An in arteriis natura sanguis contineatur*, Furley and Wilkie used the two extant Greek manuscripts, one in the Laurentian library at Florence, the other in St Mark's library at Venice, which had been used by F Albrecht to prepare a critical edition of the Greek text of *An in arteriis* in 1911 But they also used an Arabic translation made in the ninth century by the great Nestorian Christian translator Hunayn ibn Ishāq from a single Greek manuscript that was evidently earlier and more accurate than either of the Greek manuscripts that survive at Florence and Venice With characteristic thoroughness Wilkie learned Arabic in order to read the Arabic translation for himself The results of Furley's and Wilkie's study of the Arabic version were dramatic, they discovered that in the Greek text previously used two sections were in reverse order, apparently because they were derived from a Greek manuscript in which two pages were in the wrong order, presumably because a leaf had come out of the manuscript and had been reinserted backwards (see D J Furley and J S. Wilkie, "An Arabic translation solves some problems in Galen," *Classical Rev*, 1972, *22:* 164–67). The correction restored order and clarity to Galen's argument, in particular to the meaning of the experiment in which Galen isolated a short length of artery by means of two ligatures and, nevertheless, found the portion between the ligatures full of blood In the corrected text, Galen's conclusion immediately follows the experiment "So when they have agreed that the exposed arteries contain blood, we show in order, first, that they [the arteries] are moved without interruption, not only to touch but also to sight . ." (pp 169–71). In other words, Galen argued that the arteries were pulsating normally even though, as he had just demonstrated, they were full of blood

The new edition and translation of Galen's four works offers to English-speaking readers an accurate and complete version of Galen's ideas on cardiovascular physiology. David Furley and J. S. Wilkie have thus completed the transmission of Galen's ideas on these subjects begun by their ninth-century predecessors Isa ibn Yahya and Hunayn ibn Ishāq. They have shown that although Galen's attempt to replace Erasistratus's theory was not wholly successful, his mode of argument was more exact and reasonable than it seemed from the confused version of *An in arteriis* previously available.

Reviewed by LEONARD G. WILSON, Department of History of Medicine, University of Minnesota, Minneapolis

KLAUS-DIETRICH FISCHER and DIETMAR NAJOCK (comps.) ***In Pelagonii Artem Veterinariam Concordantiae.*** Hildesheim, West Germany: Olms-Weidmann, 1983. xiv + 482 pp. DM 78,00.

Pelagonius was a fourth-century writer on veterinary surgery, of whose works only a few fragments remain. His work represents a compilation of many Greek sources and earlier Latin authors and he in turn was used by Vegetius in his well-known *Mulomedicina*. He is cited frequently in the *Hippiatrika,* a collection of veterinary writings that was compiled in the ninth century. In 1980 K.-D. Fischer edited a new Teubner text of Pelagonius to replace the earlier edition of Ihm (1892). He has now produced, in collaboration with D. Najock, a concordance to accompany the new edition. Every Latin word in Pelagonius's text, including *et,* is given in the context in which it appears. Like most mechanically-produced concordances of ancient authors, this one is disappointing in not distinguishing between different meanings of the word. The volume also includes a table of *addenda et corrigenda* to the 1980 Teubner text as well as frequency lists of the words used in both the Codex Riccardianus and the Bobbiensian fragment. Altogether it is a useful companion to the text of Pelagonius.

Reviewed by GARY B. FERNGREN, Department of History, Oregon State University, Corvallis

FRED ROSNER. ***Medicine in the "Mishneh Torah" of Maimonides.*** New York: Ktav Publishing House, 1984. xiv + 325 pp. $20.00 (cloth); $9.95 (paperbound).

Although there has been some discussion on the point, it is generally thought that Maimonides was born in 1135 and thus 1985 is the 850th anniversary of his birth. The Hebrew University in Jerusalem has planned a series of events to commemorate this anniversary. In such a context, the new book of Fred Rosner provides an additional stone to the building housing the great medieval Jewish physician's works.

In fact Isaac Israeli was clearly much more widely known as a Jewish medical author than Maimonides. The latter's everlasting fame among Jewish scholars and laymen rests much more on his aptitude as a codifier of the law than on his medical achievements, not to speak of his philosophical work, the no less famous, but controversial, "Guide of the Perplexed."

The *Mishneh Torah* was originally written in Hebrew, for Jewish readers, whereas all Maimonides' medical works (ten treatises) were written in Arabic, that is, in the vernacular. However, anyone who is familiar with the topic "Medicine in the Talmud" will understand how difficult it is to detach medical statements from their legal context. With respect to the delineation of the Codes in the *Mishneh Torah,* the reader of Rosner's book who is not familiar with Jewish law will perhaps find it somewhat difficult to follow the otherwise thorough and adequate presentation (pp. 19–55).

The first chapter deals with "The Physician's Divine License to Heal," and is close to the parallel studies of Preuss and Jakobovits. The second, a translation of *Hilkhōt De ʿōt* (why spell it Hilchot De' oth?), says nothing of the many previous translations that have appeared in various languages (e.g., the English translations of M. Hyamson and the Yale Judaica series), but it is very valuable for its "Notes and References."

We shall not continue to detail the other chapters, but rather concentrate on one of them, the fifth, entitled "Obstetrics"—which is in fact mainly devoted to embryology. The lengthy quotation included from the "Medical Aphorisms of Moses" (the term "Medical" is an addition to the original title—*Pirkē Moshē*) [pp. 168–69] could be considered superfluous.

Instead of taking passages from the medical works of Maimonides that have been published elsewhere, most of them by Rosner himself, in collaboration with Sussman Muntner, we would have liked to find comparisons with other theological works of Maimonides. Let us cite one example. The author rightly states that "a child born by Cesarean section (is not) considered as a firstborn" (p. 167) and that "a male firstborn delivered by Cesarean section is exempt from redemption" (p. 173). Here Maimonides states that if a first child is delivered by Cesarean section and the second through the normal ways, none of them has the status of firstborn. Whereas in his work called *Perūsh Ha-Mishnayōt* ("Commentary on the Mishna") on Bekhorot 19a he writes: "Regarding this case, there could be only one possibility, viz. that the woman was bearing twins, first her womb was cut open and the (first) child was born, then the second one came out by the normal ways *and the woman died*. It has been asserted by commentators that a woman might survive after her womb had been cut open and (thereafter) bear another child and be delivered, but this does not make sense and seems very strange to me." Comparing such a "medical" statement, which appeared in a theological commentary, with the mere factual ruling of the *Mishneh Torah* seems to me most enlightening, both being directed towards Jewish laymen although with different aims.

I found a few errors in this chapter: e.g., p. 173, l. 28 should read (*ibid.* 11:6) instead of 1.6. Or p. 174, l. 1, should read (Murder 2:6), not *ibid.* 2·6. The transcription of the Hebrew words is sometimes strange: *Chometz Umatzah* why not *Ḥameẓ U-Maza*, *Chagigah* for Hagiga; *Bechoroth* for *Bekhorot*, etc. Bibliographical references rely heavily on Jakobovits and on Rosner's own previous works. The relevant literature in Hebrew is nowhere cited (this could have been added at the end).

At any rate, it seems to me that this book is very valuable to the Hebrew scholar who is familiar with the *Mishneh Torah* and with Rabbinical literature. It is certainly very useful to scholars of Jewish law, Jewish medical ethics and to specialists in Maimonides. Fred Rosner has an incredible ability to compile, translate, organize and bring to shape Jewish medical literature. His vast knowledge of the works of Maimonides is beyond question, and will appear clearly to the reader of this nicely printed and well-presented book.

Reviewed by SAMUEL S. KOTTEK, Division of the History of Medicine, Hebrew University-Hadassah Medical School, Jerusalem, Israel.

ENRIQUE MONTERO CARTELLE (ed.) ***Constantini Liber de coitu: El tratado de andrología de Constantino el Africano.*** Santiago de Compostela, Spain: Universidad de Santiago de Compostela, 1983. 223 pp. (paperbound)

This book grew out of the edition of the complete Latin medical works of Arnald of Villanova under the direction of professors J. A. Paniagua and Luis García Ballester. The *Liber de coitu* has long been considered, with *De sterilitate* and *De conceptione*, as belonging among Arnald's genuine writings on human sexuality. Montero's research into the text's tradition has demonstrated otherwise. With the brevity and clarity characteristic of this edition, the editor examines each of the possible authors:

Arnald, Alexander of Tralles, "Gerardus," and Constantine, whose translations of medical writings by Haly Abbas, Ibn al-Jazzār, and Isaac Israeli, among others, helped fuel the growth of the School of Salerno in the late eleventh century. The editor's account of how this confusion of authors came about is an education in itself, especially for those who have yet to encounter the morass of spurious or absent attributions that plague scholars dealing in medieval scientific texts.

Montero provides us with a critical edition in the grand and classical manner, collating a number of manuscripts and printed books, citing the Latin text's sources, and giving a facing-page Spanish translation with explanatory footnotes The text itself is a combination of simplified theory and practical advice, clearly organized into chapters No medical knowledge is assumed on the part of the medieval reader, and his modern counterpart familiar with Galenic theories on generation will find nothing surprising here. A number of recipes are grouped together at the end, and it is in this section that the monk of Monte Cassino leaves behind theory to offer a few hints on how to get the lady in the mood. A knowledge of what to do after that is taken for granted

The editor has prepared a glossary of the medical substances mentioned in his text and a short discussion of Arabic sources for Constantine's translation The reader unable to read Latin would perhaps have liked a bit more information of a general nature, but this certainly does not detract from what will doubtless prove a very useful source for the study of medieval medicine and the transmission of texts

Reviewed by **FAYE MARIE GETZ**, Wellcome Institute for the History of Medicine, London, England

AGUSTÍN RUBIO VELA. ***Pobreza, enfermedad y asistencia hospitalaria en la Valencia del siglo XIV.*** Valencia, Spain. Institución Alfonso el Magnánimo, Diputación Provincial de Valencia, 1984. 255 pp Pta 1,000 (paperbound)

Medievalists who study the Corona de Aragón—comprising Aragon, Catalonia, and Valencia—enjoy the not unmixed blessing of an astonishing quantity of documentary resources, in royal, municipal, and notarial archives. So much material can overwhelm the unwary, but a scholar who can master it is sure to make contributions of importance Agustín Rubio Vela has brilliantly used the records of fourteenth-century Valencia, then a city of perhaps 25,000 people, to study the organization and development of its hospitals, in a book whose richness of detail gives its conclusions a significance that goes far beyond this part of the Spanish peninsula.

Rubio first gives a general interpretation of fourteenth-century developments, as the hospital became in effect a secular institution, an instrument of municipal social policy designed to cope with the growing urban problem of the sick poor. (He argues that by the beginning of this period Valencian hospitals cared specifically for the sick, not the needy in general) Six hospitals existed in Valencia in 1300, and as many more were established during the next century, which Rubio divides into three periods: to 1333, a time of dynamic economic growth for the city in which new hospitals were founded by individual bourgeois, 1333–75, when famine, pestilence, and war severely damaged municipal life and charitably-endowed hospitals came near economic collapse, and after 1375, when in a time of recovery and renewed foundations the city government came largely to assume responsibility for hospital administration. He then examines carefully the first of the fourteenth-century hospitals, that established by Bernat En Clapers in 1311, many of whose account books survive for the period 1375–1400. From these he has been able to reconstruct its life and activity in remarkable detail· its finances and administration, staff (both medical and non-medical), number of beds, number and class of patients, medication, diet, and mortality Appendices make available a variety of texts, of particular interest are seven long itemized lists of drugs bought for the treatment of patients at En Clapers. So full and so solidly based an account is a valuable contribution to our understanding of the late medieval hospital

Reviewed by MICHAEL McVAUGH, Department of History, University of North Carolina, Chapel Hill.

LEONARDO DA VINCI ***Leonardo on the Human Body.*** Translations, text and introduction by CHARLES D O'MALLEY and J B DE C M SAUNDERS New York Dover Publications, 1983 (reprint of 1952 edition) 506 pp Ill. $10.95 (paperbound).

There are few paintings by Leonardo in existence, many of these in poor condition, some unfinished. Leonardo's great sculptural project, an immense equestrian statue of the father of his employer, Ludovico Sforza, was never cast, even though it occupied much of Leonardo's time for fifteen years—the bronze set aside for it went to making cannons, the clay model was used for target practice and destroyed. It is not now possible for us to appraise the ephemeral displays and ceremonies Leonardo designed for ducal weddings, the spectacles have passed, and the music of his lute has long been silent. The hydraulic engineering projects, canals and attempted diversions of rivers often came to nothing and plans for military and other machines remained ideas not realized Leonardo published no books The work on which he spent the most time was his notebooks. From an early date in Florence until his last years Leonardo added to these pages, eventually a collection of many hundred sheets, which were willed at his death to his young pupil, Francesco Melzi. Only a third or so of the original number of sheets have survived, dispersed in libraries on two continents

The range and depth of subjects annotated remain a source of amazement—how could one person have investigated so many things, so imaginatively and constructively? Nearly all the surviving anatomical manuscripts—some have been lost—are to be found amongst the Leonardo collections at Windsor; there are some 200 leaves, 400 illustrated pages They have been in the Royal Library, certainly since 1690, probably earlier. In 1795, John Chamberlaine, Keeper of the King's Drawings and Medals, published a selection, engraved by Bartolozzi; Chamberlaine described how they were "discovered soon after his present Majesty's accession in the same cabinet where Queen Caroline found the five portraits to the court of Henry VIII by Hans Holbein"

Recently the anatomical notebooks have been disassembled from their fifty-year-old bindings. Occasion was then taken to photograph every leaf under optimal conditions These photographs, reproduced with the greatest care and skill by the Curwen Press, formed the basis of the wonderful scholarly edition by Kenneth Keele and Carlo Pedretti, published in an English language edition limited to less than a thousand copies in 1979 (Johnson Reprint Company). Few private individuals could afford such a work, we must consult it in libraries But for less than twenty dollars we can now buy the Dover reprint of O'Malley and Saunders's edition, published first in 1952 and long out of print A total of 215 pages of the Leonardo notebooks from Windsor are well reproduced, each authoritatively discussed by O'Malley and Saunders, humanist and anatomist respectively, with translations of the accompanying text This book must be the best bargain in Dover's fine medical reprint list

Reviewed by K. B. ROBERTS, Faculty of Medicine, Memorial University of Newfoundland, St. John's, Newfoundland, Canada

Richard Lower's Vindicatio: A Defence of the Experimental Method (facsimile edition). Edited and introduced by KENNETH DEWHURST Translated by Leofranc Holford-Strevens. Oxford, England. Sandford Publications, 1983. xxxiv + 314 pp £25 00

The sequelae of early modern scientific discoveries usually present a problem to the historian of science· can we now confidently say with Pope "God said, 'Let Newton be, and all was light?' " Does the night drag on for some time longer? Certainly in the case of the Harveian revolution, carried forward by the Oxford physiologists, the resistance was muted, but nonetheless sufficiently apparent to occasion Richard Lower's *Vindicatio* and the sequence of controversy set forth in the volume under review. Dewhurst, in this edition, gives the general reader the opportunity of understanding that controversy and of reading the pivotal volume in the sequence of publications which gradually built the early modern framework of cardio-respiratory physiology.

The controversy began with the publication of Thomas Willis's *Diatribae duae medico-philosophae* in 1659 In it, Willis, on the basis of a mechanico-chemical conception of the Harveian circulatory physiology, concluded that fevers were brought about by an overheating of the heart This he believed was the result of a fermentation taking place in the five chemical principles of the blood, most notably in the spirits and sulphur through increased agitation of their particles In this process, known as ascension, contact between the blood and nitrosulphurous particles produced heat from the blood which was circulated throughout the body by the beat of the heart. Ascension took place, Willis concluded, in a reversion to Galenic physiology, in the left ventricle of the heart Thus he established a link between animal heat and combustion, already suggested by Descartes and Hooghelande. In the second of his treatises, Willis extended the idea to explain the origin of the full range of fevers. The effect of this work was to begin the crystallization of opposition to, and defense of, Galenism. Hitherto every advance had been accompanied by the "saving" of substantial parts of Galenic anatomy and humoral pathology, largely because the construct of Aristotelian-Scholastic causation, and especially the formal and final causes, required a consistency between the old and new elements. This was the real point of the Irishman Edmund O'Meara's conservative denunciation of the *Diatribae* in his *Examen diatribae Thomae Willisii* (1665)—a point Dewhurst largely misses in his otherwise capable Introduction. It was to answer O'Meara that Richard Lower wrote his comprehensive and highly abusive *Diatribae Thomae Willisii de febris vindicatio,* the new edition of which is the subject of this review To anticipate, another Irishman, Conlan Cashin, in 1667, denounced Lower in *Willisius male vindicatus sive medicus Oxoniensis mendacitatis et inscitae detectus,* another budget of logical objections and academic billingsgate, to the exegesis of which Dewhurst devotes an *Epilogue.*

The importance of Lower's work is that in defending Harvey's system and Willis's fermentation origin of fevers, he gathered together all the significant themes of the new physiology, while at the same time making an unqualified onslaught on humoral pathology and Galenic anatomy Specifically, he gave an emphasis to the central importance of the blood in the life process and the differences between arterial and venous blood missing from the previous works. He linked animal heat to the composition of the blood more firmly than had Willis, and he made explicit an idea that had been developing implicitly among his colleagues for years—that the blood absorbed nitrous food during the transit through the lungs

Much of this Dewhurst sets forth clearly and well He is especially concerned with the controversy, and his explanation of the larger physiological setting is somewhat meager The translation, by Leofranc Holford-Strevens, is competent insofar as the meaning is usually clear, though like all modern literal translations, it has far too many awkward Latinities. The general result, however, is a very useful and, as important, an easily used volume

Reviewed by JOHN NORRIS, Division of the History of Medicine, Faculty of Medicine, University of British Columbia, Vancouver, B.C , Canada

MARY A. B BRAZIER *A History of Neurophysiology in the Seventeenth and Eighteenth Centuries: From Concept to Experiment* New York. Raven Press, 1984. xiii + 230 pp Ill $65 00

The author of this book proposes to follow a potentially fascinating theme in the history of neurophysiology, but the results are disappointing In Mary Brazier's words, "One critical problem overrides all others in the early history of neurophysiology—the nature of the nerve impulse"(p 6) Thus, she views the historical development of her science as the process by which experimentation led to the conclusion that the nerve impulse is basically electricity This presupposition ignores the fact that the nerve impulse is actually electrochemical in nature Whether this deliberate simplification makes any historiographical difference is equally unclear at the beginning and at the end of the book, because it is not mentioned Much more distressing, however, is the author's disdainful view of the ancients, because they were not experimentalists in the modern sense In my opinion, one cannot understand the background of early modern physiology without some coherent presentation of Galenic theories, and none is provided The story simply starts out of thin air in 1600!

The format of the book is biographical The contributions of each important figure are presented in separate sections, along with many interesting (but often irrelevant) facts about the person's life Some of these biographical details serve quite well to place the individual in his historical context, but often they obscure the main theme because of their abundance In fact, the latter part of the book is actually fun to read, because the ahistoricism of the earlier part is muted and the biographies are quite fascinating. History should be fun, of course, but scholarship needs to be coherent. The biographical format worked well in Brazier's earlier contribution, *A History of the Electrical Activity of the Brain The First Half-Century* (London Pitman, 1961) precisely because the biographical details did not overwhelm the exposition of the story

In one of her stated goals, the author succeeds admirably. The book is profusely and beautifully illustrated In addition to portraits, there are many reproductions of anatomical drawings, theoretical diagrams and experimental designs The diagrams and designs are especially valuable, because they are taken from sources that may be difficult to find in most libraries

According to the preface, the author plans to publish another volume, which presumably will carry the theme of this book through the nineteenth century. One can only hope that the myriad events of that exciting time will be presented with greater clarity

Reviewed by SAMUEL H. GREENBLATT, Division of Neurological Surgery, Medical College of Ohio, Toledo

GIAMBATTISTA MORGAGNI *The Clinical Consultations of Giambattista Morgagni: The Edition of Enrico Benassi* Translated and edited by SAUL JARCHO Boston. Francis A. Countway Library of Medicine, 1984 xcix + 450 pp. $42 50 (Distributed by the University Press of Virginia)

In 1771, the year he died, Giambattista Morgagni selected and gave to his pupil Michele Girardi 100 consultation reports written between 1709 and 1751 affecting ninety-eight patients, most of them from northern Italy. These were finally published in Italian translation—Morgagni wrote easily in convoluted rococo Latin but never seems to have been comfortable when writing Tuscan—by the late Professor Enrico Benassi of Turin (Bologna: Cappelli, 1935) in an edition of only 500 copies. Benassi's edition was reviewed in no American journal, medical or historical, and is almost unknown to American readers Saul Jarcho has translated Benassi's edition, including its introduction and notes, compared these texts against Morgagni's holographs, and provided a further preface, explanatory notes and useful appendices Morgagni was the leading pathologist of his time—some would say of all time—but he was also a widely respected consulting general physician

The consultations vary in length, typically running to three printed pages, and are file copies of letters sent chiefly to other practitioners who had asked Morgagni for guidance in the management of difficult cases, even if sometimes only to reassure families that everything possible was being or had been done. That Morgagni selected these letters himself would suggest that he regarded them as among his best consultations Surviving practitioners' letters precede Morgagni's replies, and include the practitioners' accounts of the patients' histories, physical findings, progress and responses to therapy Morgagni did not ordinarily examine or see the patients, but his letters of consultation are quite carefully structured recapitulate the information provided by the practitioner, including the patient's habits and temperament, praise the practitioner; discuss the anatomical site of the disease; comment on its pathogenesis and prognosis; outline possible surgical, pharmacological and dietary management with an occasional caution or warning, cite a few references to similar cases in the ancient or contemporaneous literature; and offer a few words of consolation, whatever the prognosis And always with great courtesy—the great Morgagni was never a professor who despised the local M D Problems on which Morgagni's advice was sought included medicine, pediatrics, surgery, gynecology, otolaryngology, venereology and ophthalmology. These consultations therefore reflect the best academic medical practice during the golden age of Italian medicine, when Italy led the medical world. They also reflect the doubts and uncertainties of a period of rapid but uneven advance in knowledge, when mechanistic and humoral pathophysiology had not caught up with advances in normal or pathological anatomy, or with empiric observation, when very little predictable drug therapy existed, and when surgical operations were frightful ordeals

Translations read smoothly and the book is as carefully printed as is now possible, although footnote 710 on page 398 clearly requires the word *not.* Jarcho's preface is a valuable and detailed analysis of Morgagni's clinical thought and practice. Jarcho understands Morgagni's medical world, and his citations of eighteenth-century sources and particularly his notes on the contemporaneous use of drugs recommended by Morgagni are extremely helpful. Appendix I.8 (pp. 314–15) exactly outlines how mercurial salivation was to be carried out for patients with syphilis, including a dosage schedule for the mercury and instructions about mouthwashes, gargles and diet; and Appendix III by D W and J W Stevenson (pp 319–24) gives the current nomenclature for the botanical preparations in Morgagni's letters. None of this useful information is conveniently available elsewhere

The book is warmly recommended as a permanently valuable and very meticulously documented study of one consulting physician's practice, 1709–51 That the consultant was Morgagni and his interpreter Dr. Jarcho makes it doubly welcome. And has anyone since Gibbon written such entertaining footnotes?

Reviewed by WILLIAM D. SHARPE, Director of Laboratories, Cabrini Medical Center, New York.

J. STEENDIJK-KUYPERS. ***Apotheek 'De Grotte Gaper': en andere artikelen uit de winkel van de 19de eeuwse gezondheidszorg te Hoorn.*** Amsterdam. Editions Rodopi, 1983. 120 pp. Ill. (paperbound).

J VOEGEN VAN ENGELEN. ***De Surinaamsche Artz, 1786–1788.*** Utrecht. Foundation for Scientific Research in Surinam and the Netherlands Antilles, 1981 (facsimile edition with introduction by G. A. Lindeboom). xxvi + 101 pp

There may be more antiquarian appeal than historical value not only in this facsimile of eleven "issues" (each a mere eight pages in length) of a journal published in Dutch Guiana but also in the collection of twelve light essays (unnumbered and rather loosely related) on health care in a small North Holland town The book on Hoorn aims at the general reader, as did the original edition of the Surinam journal, and both contain some useful information but will disappoint the serious researcher by their incompleteness

De Surinaamsche Artz has the benefit of an introduction by G A. Lindeboom, who reconstructs the short life (1755/56–1793?) and erratic career of the author, summarizes the medical history of Surinam, and briefly comments on the reproduced text. Dr Voegen van Engelen, son of a minor figure in Dutch literature and himself a restless publicist since his early twenties, began his journal soon after arriving in Surinam. He filled its first two years with ruminations on the Guianan climate, drawing his inspiration from the Hippocratic treatise *On Airs, Waters and Places.* His contemporary citations echo the idiosyncrasies of the Enlightenment as well as old "superstitions" such as the lunar explanations of menstruation, epilepsy and insanity, his views reflect the late eighteenth-century fascination with meteorology and electricity; and his major advice is rooted in the belief that deforestation is the key to a healthier climate. These climatological observations were intended to introduce the journal's main course, which was to be devoted to local tropical diseases and their treatment Unfortunately, this announced "second series" never saw the light of day, probably due to insufficient support and because van Engelen became absorbed by professional and official tasks

Similarly introductory are Steendijk's entertaining excursions into Hoorn's past, and by her own admission they leave "ample room" for further research on every subject Little information is provided, for example, about the origin and diffusion of the *Gaper* emblem that figures in the titles of the book and of the first two essays (and also in the cover illustration). This face, usually Moorish or oriental, identified not only the pharmacy of the Best family in Hoorn but also the shops of druggists, apothecaries and herbalists for centuries The emblem has no further bearing on the other essays, whose topics range from medical organizations and hospitals to social programs and the cholera epidemics

Whatever the historian of medicine may find relevant in the *Artz* and in the *Gaper*, the student of modern history will be struck by the somber background they share in the waning of Holland's Golden Age Letters from readers to the *Artz*, referring to empty docks and deserted plantations, poignantly illustrate the decline of the Dutch colony after 1775. The effects on the homeland did not spare the harbor town of Hoorn which, depopulated and impoverished by natural and man-made disasters, saw the clientele of its inherited health trades shrink and the welfare burden on its burghers increase.

Reviewed by LUKE DEMAITRE, Department of History, Pace University, Pleasantville, New York

DORINDA OUTRAM *Georges Cuvier: Vocation, Science and Authority in Post-Revolutionary France.* Manchester, England Manchester University Press, 1984. 299 pp £25 00

Although Dorinda Outram's new book on Cuvier is openly polemical, in that she argues against the biographical tradition surrounding Cuvier's reputation, her study is not a new biography on the leading life scientist of the early nineteenth century Instead, as the subtitle of her book suggests, it is a study of Cuvier's career how one came to be a successful scientist in the post-revolutionary period in France, what that meant, and in what ways power and ideas were related. The result is an extremely interesting book that is filled with fertile suggestions, valuable insights, and a new picture of Cuvier's public career Outram follows Cuvier from his modest background in the Protestant principality of Montbéliard, through his rigid education in Stuttgart, to his brief but significant period in Caen as a tutor, and then to his "conquest of the city"—Paris

Unfortunately, the most critical periods of the story are also those for which the manuscript record is most fragmentary Outram makes up for this deficiency by providing a valuable discussion on the nature of the patronage system as it existed in the post-revolutionary period in France She shows how power was a highly personal commodity which cannot be understood by focusing attention exclusively on the history of institutions. She also argues that Cuvier's rapid rise was due to his ability to exploit several different patrons—not all scientific—and not to be dependent on anyone. She also cautions the reader that the circumstances in which Cuvier operated were peculiar to the time and do not provide a general model. Outram nonetheless does discuss the general issue of the tension between the professional demands of the scientist and his public role. She does this very intelligently by establishing how Cuvier distinguished what was appropriate to discuss in official scientific contexts and what he stated in the public arena. She also establishes how and why Cuvier could not always be consistent.

In the absence of manuscript documentation, one might not be completely convinced of Outram's re-creation of Cuvier's career. Most experts on the period will find something to pick at in her presentation. They may also question the polemical fury that is aimed at mostly strawmen. The majority of readers will resent the extensive quotations that are untranslated and not paraphrased. However, the book makes important contributions by providing a new detailed study of Cuvier's career, and by focusing attention on the need for a better understanding of the patronage system in the development of science.

Reviewed by **PAUL LAWRENCE FARBER**, Department of General Science, Oregon State University, Corvallis.

ROBERT A. NYE. ***Crime, Madness, and Politics in Modern France: The Medical Concept of National Decline.*** Princeton, N.J.: Princeton University Press, 1984. xv + 367 pp. $35.00.

Robert A. Nye has written a fascinating book that is not entirely certain of its intentions. It is essentially about certain aspects of criminological thought and legislation during the early years of the French Third Republic. Occasionally, however, it moves outward to other forms of deviance and to deviance itself as an emerging social and intellectual category. It begins with a powerful thesis that is never convincingly demonstrated and which does not provide a structural scaffolding for the rest of the work. It serves rather as a point of reference for a series of essays which range considerable distances and which touch down periodically on the main theme (sometimes extensively and sometimes briefly) to illustrate, reassert and occasionally develop it.

This theme, as I understand it from Nye's introduction, is inspired primarily by the work of Michel Foucault. Nye argues that from the middle and especially the end of the nineteenth century, French doctors developed a medical vision of deviance integrating crime, madness, alcoholism, and prostitution. In so doing, they were seeking to extend the authority of medicine into new domains. They were, however, also responding to a real social need created by the unique historical circumstances of nineteenth-century France, principally population stagnation, a host of social problems and a generalized sense of national decadence. Supported by the penchant of republican scientism for "scientific" explanations, they elaborated a concept of deviance based on a medical model of biological degeneration, itself founded on Lamarckian transformism. This vision eventually became predominant, exercising "a linguistic and conceptual imperialism."

From these beginnings, Nye goes on to examine a wide variety of apparently heterogenous issues A simple list of chapter subjects gives some indication of this variety: recent efforts to study deviance; an introduction to French legal and medical institutions of the nineteenth century; the relegation law of 1885 making transport to a penal colony the punishment for habitual criminals, the debate among criminologists of the 1880s and 90s regarding the hereditary nature of criminality, the development of a medical theory of degeneration, treatment by the popular press of violent criminality at the turn of the century; debates over insanity and criminal responsibility, the debate over capital punishment in the Chamber of Deputies in 1908; and finally sport and athletics as partial responses to degeneration theory

Running through these various subjects (and I make no pretense of completeness) is the indisputable fact that medical metaphors, among them degeneration theory, were commonly applied to social issues at the end of the nineteenth century However, to make a convincing case for his far more elaborate argument, Nye would need to mount a considerably more focused epistemological operation. He would need, among other things, to refine his definitions. He would have to distinguish much more clearly than he does between medical and biological models and influences. The two are by no means synonymous even if they are often related The term "medical" as well could profit from more rigorous definition Is it degeneration theory specifically or any recourse to organic metaphors and the notions of normal-pathological? And how would it affect Nye's argument if one could demonstrate, as I think one can, that degeneration theory was hardly "a dominant diagnostic model" of mainstream medicine. (It is one of the peculiarities of medicine that those of its procedures and institutions with the greatest social relevance are precisely the ones with the least internal status) Finally, one would also need to separate analytically elaborate concepts, with or without practical implications, from metaphors which can be fundamentally interchangeable and trotted out according to rhetorical need Similarly, one would have to distinguish between substantive and merely terminological influences. Criminology almost certainly utilized an increasingly medical discourse. From the evidence presented by Nye, however, I find it difficult to perceive any real "medicalization" of the criminal justice system, except in such traditional areas of medical expertise as the definition of legal insanity. Recourse to such discourse is certainly a significant phenomenon which demands close scrutiny. But one should not confuse surface gloss with underlying substance (to appeal to a non-medical metaphor)

The question of medicalization aside, Robert Nye has written a fine book The very qualities of sensibility which prevent him from focusing narrowly on a single argument are precisely those which make his essays so compellingly readable. These range far and wide, touching on a variety of apparently tangential but in fact highly relevant topics like republican politics, the historiographical debate over the pre-1914 nationalist revival in France, and the manner in which the press exercises its influence on public opinion The essays are gracefully written and wear their considerable erudition lightly The careful reader of this volume will learn an enormous amount about the evolution of criminological thought and legislation in the nineteenth century and about a great many other subjects besides. Historians of medicine, in particular, will gain a fresh perspective on their own discipline as a result of this book.

Reviewed by **GEORGE WEISZ**, Department of Humanities and Social Studies in Medicine, McGill University, Montreal, Quebec, Canada

RIMA D APPLE (comp) ***Illustrated Catalogue of the Slide Archive of Historical Medical Photographs at Stony Brook*** Westport, Conn. and London. Greenwood Press, 1984 xi + 442 pp. Ill $55 00

STANLEY B BURNS ***Early Medical Photography in America (1839–1883)*** New York The Burns Archive, 1983 (reprinted from the *New York State Medical Journal*) viii + 124 pp Ill $85 00 (Order from Stanley B. Burns, 30 E 60th Street, New York, New York 10022).

Photographs are such easy things to use. As historical sources it is surprising that medical historians have not turned to them more often. There, literally in black and white, is what the past really looked like. With comparative ease the researcher can quickly discover exactly how Victorian wards were furnished, how surgery was performed, what nurses did in their spare time Perhaps it is because intellectuals like creating difficulties for themselves that they turn to manuscripts and texts in search of hermeneutic problems Perhaps, however, it is also a lurking suspicion that things may not be quite what they seem that makes historians fight shy of pictures. If photographs are artefacts every bit as socially constructed as texts, and there are very good reasons for holding this to be the case, then their interpretation almost inevitably becomes far harder than that of written sources. This must be so for two reasons. First, there is virtually no interpretive tradition within which historians can work. The second problem lies in the sources themselves Unlike books, more often than not, photographs are found without context, without a surrounding text and with no tangible indication of their author or their use The imaginative historian therefore can make up hundreds of plausible stories about any given picture John Berger has often pointed this out. All too often though, the meaning imputed to a picture is naturalized in the affirmation that the photograph is a copy of reality Interpretations are not regarded as necessary, because quite simply, photographs seem to show us what the world is like. It is for the most cunning of historical reasons we take at face value the assertion that the camera truly describes nature The credulity of scholars in this matter would seem risible were the object in question not a photograph but the text of a Renaissance magician or a phrenologist The asymmetrical practice of historians is sometimes quite startling

The scholars who projected and organized the medical photography collection at Stony Brook, as is evident from the preface to this volume, were clearly set on reforming bad historical habits The project was intended to copy medical photographs throughout America and centralize the reproductions, with all available data, in order to stimulate pictorial research This was no easy task as anyone familiar with collecting photographs will be aware Photographic prints are usually treated with far less reverence than books and, whereas the latter are often carefully stored and indexed in hospital libraries, photographs are often found moldering in the basement. The project was not confined to hospitals, though, the organizers interpreting medicine very broadly The published catalogue from photograph number 1, a clinical picture of an hydatid cyst, to number 3171, a phrenologist at work, describes the collection The catalogue is unusual, insofar as it not only describes the pictures but reproduces every one of them in prints little larger than an inch across With the aid of a magnifying glass the system works well The book has four cross-referenced indices name, geography, subject and chronology These are excellent although possibly occasionally opaque to a non-American reader No one in England would think to look up anatomy under laboratory Whether the center will form the focus for a more serious use of photographs, or whether it will simply be plundered as a source of illustrations, remains to be seen

One person who has taken seriously the collecting and study of photographs is Stanley Burns His interest lies in the reproductive capacities of the technology, not the semiotics of the print. This monograph, ***Early Medical Photography in America (1839–1883),*** is compiled from his articles reprinted from the *New York State Journal of Medicine.* Burns's work is based on his own impressive collection "The Burns Archive." The virtue of Burns's book is that he has bothered to go out in the field and base his assertions about early photographic practice on the evidence that remains. This may seem obvious enough, yet Burns shows, triumphantly, that photography was used extensively in representing both medical institutions and clinical cases in mid-nineteenth-century America This, he claims, was not formerly held to be the case, and his discovery therefore certainly rates as the most original feature of this book. It must also be said that Burns reproduces a selection of the most extraordinary and surprising pictures that I have ever seen. This element of surprise is not dissolved by the text and it is this perhaps which points to the book's orthodox approach to pictorial material It does not historicize the images. For Burns they are pictures *of* the past, not nineteenth-century modes of cultural representation There is absolutely no sense in this book of what meanings contemporaries would have given these pictures

Reviewed by CHRISTOPHER LAWRENCE, Wellcome Institute for the History of Medicine, London, England

MARKUS ERNST SALVETTI ***Gefässpsychopathologie bei Richard von Krafft-Ebing (1840–1902).*** Bern-Stuttgart-Vienna: Hans Huber Verlag, 1984 (Berner Beiträge zur Geshichte der Medizin und der Naturwissenschaften, new series, vol 10). 125 pp. Sw. Fr. 25,00, DM29,00 (paperbound).

Krafft-Ebing is mainly known for his treatise on "Psychopathology Sexualis" (1886), but his writings range over a broad number of topics including clinical symptomatology as well as a textbook of psychiatry (1879), and several treatises concerning forensic psychiatry (as early as 1873). The present monograph is a review by its author of Krafft-Ebing's theories on the influence of vascular disturbances in various psychopathological entities

The first part of this work is prefaced by a summary of the history of the vascular system and its innervation and a list of publications concerning it, as well as by a short biography of Krafft-Ebing. This is followed by a review of the origins of insanity as viewed by Krafft-Ebing. This review can only be described as wide-ranging, but for this reader at least, it is also thoroughly disorganized

A so-called second part of the monograph is entitled "forms of insanity due to, or with marked vascular psychopathology." Again, it ranges over a bewildering array of clinical pictures, often with little connection to one another, even though they are placed in the same category It does not help either that the quotations from Krafft-Ebing are not given in any chronological order.

In essence, no matter which psychopathological entity is discussed, it emerges that Krafft-Ebing's basic theory of the mental disturbance, whatever that may be, is due to either too large or too small a blood flow to certain affected areas. Coming from an author who lived in Kraepelin's time and during a period of flourishing pathological anatomical research, this represents very scant and simplified theories indeed. In summary, while shedding some historically interesting light on Krafft-Ebing's theories, this monograph is basically dated and of little interest to the modern reader.

Reviewed by **MARIE-LOUISE SCHOELLY**, History of Psychiatry Section, Department of Psychiatry, New York Hospital-Cornell Medical Center, New York.

JAMES SUMMERVILLE. ***Educating Black Doctors: A History of Meharry Medical College.*** University, Alabama. University of Alabama Press, 1983. xiii + 279 pp. $22.50.

With the exception of Howard University no other medical school has graduated as many black physicians as has Meharry Medical College. Thus, James Summerville's well-written work is a major contribution to the history of medical education nationally and particularly of the South. In the first one-third of the book Summerville describes the origins of Meharry which occurred in the wake of the Civil War. He shows that the institution was the outgrowth of Northern church philanthropy, freedmen's aid and self-help, and the earnest strivings of missionary individuals of the Meharry family. The addition of other programs in dentistry, pharmacy and nursing during the 1870s and 1880s is also chronicled.

The strength of this book is that it sets the story of Meharry in the context of local and national socio-political currents. Hence, in describing the formative decades of the College, Summerville points out the strong influence that the widespread poverty and serious health care needs of the local Nashville black community and the South as a whole had on inspiring the controllers, faculty and early graduates of the College. At the turn of the century, "Forces that united [the] black doctors were many," writes Summerville, "the challenges of facts to be mastered and taught, a vision of reducing illness that beset their people, [and] the political and social oppression that they and their students endured" (p. 41).

In the middle third of *Educating Black Doctors* Summerville describes deftly how Meharry managed to progress during the mid-twentieth century. The institution trained an increasing number of physicians who passed state licensing examinations despite facing severe financial and social pressures. These obstacles included the lack of enough private and public funds for substantial expansion of any of its classroom or laboratory space from 1931 to 1965, a time when medical education and practice standards were spiraling upward. Another drawback was the perpetuation of a non-black presidency at the College through the early 1950s. The author emphasizes that the rising consciousness of civil rights and educational equality following World War II necessitated that Meharry draw leadership from the black medical community which could provide more effective role models and administrative sensitivity to the black medical trainee.

The last portion of the book highlights the rise of a "New Meharry" which Summerville reveals was linked to the civil rights movement and the health policy programs of the federal War On Poverty. By 1970, Meharry was second only to Howard University among the nation's traditionally black colleges receiving federal funds. The results were the development of new patient care facilities, as well as classrooms, research laboratories and dormitories. Also, the character of the student body, 20 percent of which was now non-black, had changed to encompass both Hispanics and Native Americans

Educating Black Doctors contains much information about little known aspects of the Meharry experience that embellishes the overall quality of the book. Especially noteworthy is the discussion of the role of Daniel Hale Williams (the renowned surgeon) and Charles V. Roman (a forefather of the National Medical Association) in the College's early struggle to excel Also, there is a stimulating account of how Dr Matthew Walker and fellow Meharry faculty and students established a link with a medical facility in Mound Bayou, Mississippi, in the 1940s to serve this impoverished Delta community The health work spearheaded by Meharry in Mound Bayou continued through the 1960s.

There is one chief shortcoming to this work. The author limited his manuscript and newspaper sources almost exclusively to those produced and housed in Nashville. Other materials such as foundation records, black newspapers and alumni information related to the College and its graduates found in various repositories in Chicago, New York and Philadelphia were not examined. Thus, the institution's symbolic and substantive importance in providing medical personnel and leadership to the expanding black communities of the contemporary urban North is not adequately emphasized

Nonetheless, the book is by far one of the best, most invigorating social histories pertaining to an American minority group's medical experience yet written The photographs and physical aspects of the book are simply top-notch, and there is an enlightening foreword by Lloyd C. Elam, the chancellor of Meharry In short, *Educating Black Doctors* is well worth the attention of academicians and policy-makers interested in the larger significance of Meharry to past and future American medical education

Reviewed by DAVID McBRIDE, Departments of History and Afro-American and African Studies, State University of New York at Binghamton

MARGARETE SANDELOWSKI ***Pain, Pleasure and American Childbirth: From the Twilight Sleep to the Read Method, 1914–1960.*** Westport, Conn. and London Greenwood Press, 1984 xix + 152 pp $27 95.

What the poet Adrienne Rich identified in 1976 as "the theft of childbirth" from women by the American medical profession became an article of faith among feminist health reformers, and this orthodoxy, in part, informed histories written by feminist sympathizers Those initial studies offered, instead of analysis, a bleak scenario in which a few doctors of unusual cunning perpetrated an obstetric crime against an unusually large population of women too dull to perceive their own victimization. Happily, an emerging generation of scholars, though still perceptibly exercised over the constraints placed on women's decision-making power by the medical profession in obstetric matters, is willing to grant them a more generous role in the changing definition of childbirth Margarete Sandelowski is such a revisionist. According to her, the triumphant medical model of childbirth is less a study in male doctors outwitting their female patients than it is the result of an ongoing dialectic between women with changing expectations about the experience of childbirth and doctors capable of responding to those expressed needs.

Sandelowski identifies 1914 and 1948 as important years in which crucial shifts of attitude occurred among upper- and middle-class women regarding the nature of childbirth. In the early part of the century, they demanded from their obstetricians relief from pain during birth. By the middle decades of the century women rebelled against the wholesale use of pain relievers during labor and delivery as part of their quest to experience a "natural" childbirth When women confronted the medical profession with the challenge to first integrate pain relief in their management of childbirth and, then, to permit them a level of autonomy in the birth room, they offered doctors an opportunity to seize the initiative and establish themselves as the final arbiters of acceptable obstetric practice How this unexpected outcome resulted from women's desire to define childbirth for themselves is described ably by Sandelowski.

In 1914, educated, financially well-off, white women challenged the traditional idea that pain during birth was inevitable and necessary. They wanted relief from that pain; and, further, insisted on defining the nature of the sought-after pain relief. Encouraged by reports from women who had given birth in European clinics while in a "Twilight Sleep," reformers promoted the universal use of the technique through the pages of popular magazines They intended such publicity to serve two purposes. First, knowledgeable women could demand "Twilight Sleep" from their doctors; and, second, reluctant doctors would then be persuaded to free women from the pain of birth thought natural to the act. In Sandelowski's opinion, those actions represented nothing less than a "lay revolt against the medical expropriation of knowledge" (p 13) Their efforts proved ironically successful By 1920, they had the support of an eminent obstetrician, Joseph DeLee, whom Sandelowski holds "most responsible for convincing professionals and the general public that childbirth was a potential biological nightmare for modern women" (p 42) The demands of those modern women, however, coincided unknowingly with DeLee's secret agenda to modernize the practice of obstetrics by making it appear scientific To be considered as scientifically respectable as other specialists, he urged obstetricians to adopt an intrusive posture in their management of childbirth replete with pain-killing drugs, instruments and routine use of pre-birth procedures such as episiotomies. Women got the pain relief they wanted In exchange, doctors were able to seize the definition of childbirth and characterize it in terms which suited their own aspirations.

By the late 1940s, women noticed they had given up too much of their childbirth experience to doctors. In a wave of nostalgia, they longed for the return of their lost sensibilities so they might have a natural childbirth Women were encouraged in this new campaign by the professional and lay publicizing of a book, *Childbirth Without Fear,* written by a British obstetrician, Grantly Dick-Read, and published in the United States in 1944 Read's method involved interceding during birth pain, but not with drugs Read encouraged and educated women to confront their fear of pain as a means of achieving a pleasurable childbirth This idea, of course, stood starkly at odds with the prevailing medical dogma that only drugs ensured a trauma-free labor and delivery for women Obstetricians were helpless to quell what Sandelowski characterizes as the middle-class "craze" for natural childbirth, but they were not as impotent when it came to defending their hard-won reputation for obstetric expertise which rested partially on their technical skill as drug administerers Since they considered this function crucial to the maintenance of their professional prerogative in obstetric matters, pro-drug obstetricians created a prepared, educated patient who valued the expert use of drugs in natural childbirth. Natural childbirth, they convinced women, did not have to mean *natural* (emphasis mine) Once again, women attempted to retrieve childbirth from professional hands only to have their efforts serve the needs of the obstetrician

Sandelowski, a professional educator at Louisiana State University Medical Center School of Nursing, has added to the history of childbirth in America the voices of a discrete class of women. For this, she deserves recognition as a serious practitioner of a new social history of medicine. Her interpretation can be faulted for its continued emphasis on the power of the medical profession to manipulate women and the supposed duplicity of educated women What else can be made of Sandelowski's statement that "... Natural Childbirth showed that women could be trained to be happy even when the substantive elements of childbirth had changed very little" (p 135) While she makes us aware of women's presence in the evolution of obstetric practice and presents them as actors, Sandelowski permits them no new role Women remain victims

Reviewed by GAIL PAT PARSONS, Kansas City, Missouri

SANTIAGO RAMÓN Y CAJAL *The Neuron and the Glial Cell* Translated and edited by JACK DE LA TORRE and WILLIAM C. GIBSON Springfield, Ill.. Charles C Thomas, 1984 viii + 355 pp Ill. $39.75.

Santiago Ramón y Cajal once wrote that the style of scientific writing should be "genuinely didactic, temperate, simple, without affectation and free of preoccupations other than order and clarity.... The scientific writer should aspire continuously to reflect the objective reality with the perfect serenity and ingenuity of a mirror, drawing with the word like the painter with the brush...." And thus he wrote So tidy is the structure of his language, so orderly the flow of ideas and so pristine the whole ensemble that even a translation of his text into the English language reflects his original style Of course, the translators should share in the merit, but I have a hunch that their work was streamlined by the directness of expression prevalent in Cajal's work

It is commendable that a translation to the English language of the fundamental treatise published by Cajal both in Spanish and in French, has been undertaken As Yakovlev once noted "Cajal was never wrong" His descriptions of the structure of the neuron, the morphology of the neuroglia, the texture of the nervous system and his forceful defense of the individuality of the neuron and of the theory of dynamic axipetal polarization are classic writings, by no means demodé or antiquated The offering to the English reader of these works opens a direct line of communication with the master neuroscientist Who knows what hidden perspectives and unexpected dimensions may, thus, become available to the interested scientist unable to read the original writings!

The translation of the text has been done with care and is free of the contortions of language sometimes observed in hurried translations. In fact, the resultant English text is reminiscent of Cajal's style in Spanish, as pointed out above However, the original title, in itself a landmark of historical dimensions in neurohistology, has been changed beyond recognition, causing some initial confusion to connoisseurs of Cajal's work. The reproduction of the original drawings and prints is irregular and in some places it is unambiguously of mediocre quality It is desirable that this deficiency, being technical in nature and presumably correctable, be remedied in future reprints

This English version was published in 1984, the year that marked the fiftieth anniversary of Cajal's death It should be the prized possession of those who admire Cajal, but as pointed out in the translators' preface it is also intended to rekindle interest in the basic ideas and facts of neurohistology And this shall be accomplished by reading the book, for the work is as contemporary today as it was in 1909 when it was first published, three years after Cajal was awarded the Nobel Prize. It is recommended to the broad spectrum of professionals interested in the neurosciences, but as Cajal would have noted, it should be of particular value to students initiating a voyage into the once "terra incognita" of the nervous system

Reviewed by ANTONIO CULEBRAS, Department of Neurology, SUNY Upstate Medical Center, Syracuse, New York

EMIKO OHNUKI-TIERNEY. ***Illness and Culture in Contemporary Japan. An Anthropological View.*** Cambridge and New York Cambridge University Press, 1984 xiv + 242 pp. $37.50 (cloth), $9.95 (paperbound)

Emiko Ohnuki-Tierney, well-known for her Ainu studies, undertook her first fieldwork in Japan as a native and produced this fascinating book Based on a variety of information gathered in the Kyoto-Osaka-Kobe area in 1979–80, the book, in Part I, analyzes the beliefs about hygiene and illness held by the Japanese, and devotes Part II (Medical pluralism) to three systems of health care popular in urban Japan—*kanpo* (the Japanese version of Chinese medicine, including moxibustion and acupuncture), therapeutic religions, and biomedicine, which is synonymous with Western medicine Throughout, the author emphasizes the cultural relationship of illness and health care, and this requires some elaboration

The term *cultural* is used in at least four senses First, it refers to "distinctively" Japanese, as exemplified by "Japanese germs " The most illustrative example is the medical setting supposedly modeled on the West which also reveals a very Japanese pattern of doctor-patient interaction such as the need for personal introductions Here the author draws upon twenty years of experience in the United States, her second home, for contrasting experience Secondly, *cultural* implies the integration of parts into a whole, relating to the author's argument against isolating illness and medicine from the entire matrix of culture and society The book thus extends its scope to general beliefs, customs, the family and other institutions, and human relations. The third dimension is historical persistence Despite emergence of their country as an advanced world power, the Japanese people continue to show a heavy reliance upon the magic provided at shrines and temples as well as upon the tradition-loaded *kanpo.* The author thus refutes the conventional notion that modernization undermines "primitive" beliefs and practices. Finally, *cultural* is equated with "symbolic" which stands for ideological, meaningful, or metaphorical as opposed to physical, economic, or utilitarian This symbolic standpoint, often coupled with structuralist schemes, is most consistently advocated for understanding medical problems

Ohnuki-Tierney is ingenious in clearing away the traffic jam of ethnographic details by bold generalizations And yet when released from theoretical constraints, she exhibits a delightful perceptiveness about ethnographic details, whether in a clinic, a bus, or on the roadside Generalization and observation are difficult to synchronize, and Ohnuki-Tierney is occasionally trapped into the dilemma of sacrificing empirical fidelity to save a generalized proposition. She characterizes Japanese etiology, for example, as "physiomorphic" in its exclusion of psychological factors, which I find too hasty a judgment, unless "psychological" is wrongly equated with psychoanalytic. Further, the word *hitogomi* is translated as "people-dirt" instead of "a crowd of people" as it should be I would have dismissed this as a trivial oversight were the word not mentioned many times in support of the author's repeated generalization about the Japanese "opposition" of inside/pure/healthy versus outside/impure/ill. These reservations aside, this book should be mandatory reading for medical professionals as well as anthropologists and Japan specialists.

Reviewed by TAKIE SUGIYAMA LEBRA, Department of Anthropology, University of Hawaii, Honolulu.

D HEYWARD BROCK and ANN HARWARD (eds) ***The Culture of Biomedicine*** Newark. University of Delaware Press, 1984 (Studies in Science and Culture, vol 1). 200 pp. $24.50.

The foreign botanist surveying the cultural soil of North America can never fail to be amazed by its fertility. It seemingly produces crops in inexhaustible abundance and variety Today new species grow in the interstices between old cultural forms; tomorrow another variety will penetrate the newly created interjacent space Often the most recent intrusions can be spotted by a profusion of neologistic foliage, and a replication of phraseological parts. Such a plant, "culture of biomedicine," has recently forced its way up in between a number of longer established variants such as medical ethics or the humanities and medicine Its pithless morphology should guarantee its survival The collector can easily recognize the species by a number of signs "Medicine has become an expression of culture" (p. 34); "To take medicine as a phenomenon is in part to be confronted by the significance of a certain conception about human life" (p. 67); "The universe is run by natural forces, not by moral laws" (p 73); "environmental bioethics is concerned with the life and possible death of human society" (p. 125) Historians will, in general, find trite the sorts of judgment in which this book deals, the ritualistic Herbert Spencer bashing of the first paper being a notable example. Darwin, by contrast, is the sung and unsung hero of several of the papers in this volume Michael Ruse for instance wondering why Darwin's ideas "survived" is drawn to the penetrating conclusion "simply and obviously they survived because Darwin had something to say of lasting value" (p. 100) One can only be surprised that he did not say "because they were the fittest " In another essay Richard Laner briefly grasps the nettle which Ruse has avoided, he writes "the very idea of 'natureizing' human life is itself an historical consequence of. . ."—Of what one wonders, in the hope of illumination—" genuine changes in human reality" is the not very illuminating answer (p. 64). It is unfair to criticize a whole book because of some etiolated foliage it carries. Sometimes the aphorisms hit the mark: "Medicine suffers" says David Thomasma in his perceptive piece, "from an abundance of means and a poverty of ends" (p. 43). In general, though, one is left with the suspicion that "culture of biomedicine" is not a constructive analysis of medicine but a very insidious defense of the *status quo*. For this reason perhaps the observer should not be surprised to find that this plant will flourish in spite of its lack of a procreative organ, a tool of political analysis

Reviewed by CHRISTOPHER LAWRENCE, Wellcome Institute for the History of Medicine, London, England.

BOOK NOTES

MAXWELL FINLAND (ed) ***The Harvard Medical Unit at Boston City Hospital, Volume I: History of the Thorndike Memorial Laboratory and the Harvard Medical Services from Their Founding Until 1974*** Boston. Harvard Medical School, 1982 xvii + 902 pp Ill $50.00

MAXWELL FINLAND and WILLIAM B CASTLE (comps) ***The Harvard Medical Unit at Boston City Hospital, Volume II: An Autobiography: Part I, The Peabody-Minot Tradition, 1915–1950*** and ***Part II, The Castle-Finland Era, 1951–1974*** (1 volume in 2). Boston: Harvard Medical School, 1983. xxvii + 1,441 pp. Ill. $50 00 (Both distributed by the University Press of Virginia for the Francis A. Countway Library of Medicine)

This is an extraordinary compilation of historical materials, as much archive as formal history. The first volume is a collective work, organized largely in terms of clinical specialty (there are sections on hematology, for example, endocrinology and cardiology) The chapters vary in quality and focus, but are generally useful The book concludes with a directory of every staff member and fellow who had served in the Harvard unit The second volume (published as two books, the first covering the years 1915–1950, "The Peabody-Minot Tradition" and the second, 1951–1974, "The Castle-Finland Era") consists of autobiographical statements contributed by more than four hundred of the alumni of the Harvard Medical Unit. They provide a fascinating collective biography of an institution—and insight into career patterns in twentieth-century medicine. Though invaluable to future historians, the sketches would have been even more useful had they followed a consistent format The general history of the Harvard Medical Unit still remains to be written—but its writer will be enormously indebted to this valuable venture in collaborative history.

HAROLD L. KLAWANS ***The Medicine of History: From Paracelsus to Freud.*** New York Raven Press, 1982. ix + 238 pp Ill $29.50

Collected together, this series of essays by a professor of neurology in Chicago with broad historical interests makes informative reading Ranging from a discussion of the acromegaly of the Emperor Maximus to papers on the role of Edward Hare and S Weir Mitchell in the discovery of Horner's syndrome, to an analysis of the court-martial of Surgeon General William Hammond, and such various topics as Francesco Redi on spectacles, and Sir Patrick Manson and the kidnapping of Sun Yat-sen, the book will please many, especially those interested in the history of neurology A word of caution may be in order, because the author has very high praise for some secondary works not held in such high esteem by experts.

BETTY LEYERLE *Moving and Shaking American Medicine: The Structure of a Socioeconomic Transformation.* Westport, Conn. and London: Greenwood Press, 1984. vii + 218 pp $27 95

The current crisis and transformation of the United States health care system cannot be understood without appreciating the role of "the single most important force within our social system—American capitalism," explains the author, who develops a non-conspiratorial, systemic analysis of current trends. She examines reimbursement policies of third-party payers, industrial health programs, health maintenance organizations, corporate roles in health care planning and the adaptations of health care providers to structural pressures. The author concludes that the activities of corporations, intent upon restructuring and rationalizing health care delivery in order to cut costs, have fundamentally altered the image, ideology and authority of physicians

GIUSEPPE MONTALENTI and PAOLO ROSSI (eds) *Lazzaro Spallanzani e la biologia del settecento: teorie, esperimenti, istituzioni, scientifiche.* Florence: Leo S. Olschki, 1982 (Biblioteca della "Rivista di storia delle scienze mediche e naturali," vol 22). xii + 625 pp (paperbound).

This extended version of the proceedings of the Spallanzani conference, held in March 1981 in Reggio Emilia, Modena, Scandiano and Pavia, provides a good sampling of the variety of approaches to this great eighteenth-century physiologist and the enthusiasms he continues to inspire. It would, perhaps, be too much to expect great originality on such occasions, but the contributions of François Duchesneau, Thomas Hall, Richard Toellner, Ferdinando Abri and Massimo Aloisi all provide useful additions to Spallanzani studies Inevitably these are balanced by a large number of routine and even jejune contributions.

JOHN CULE *A Doctor for the People: 2000 Years of General Practice in Britain.* London. Update Books, 1980. 145 pp. Ill. £13 50, $39.50 (Distributed by Kluwer Boston, Hingham, Mass., in the U S)

This superbly illustrated book traces the role of the practitioner of medicine from pre-Roman Britain to the early twentieth century. The text is interesting and historically well informed, but because of the large use of space devoted to photographs and paintings, it is often very brief. Much of the story told by Cule is well known, but it will be useful to have it available with so many good pictures. If doctors still put books in their waiting rooms, this would be a suitable choice.

FERNANDO MAÑÉ GARZON *Pedro Visca: Fundador de la Clinica Medica en el Uruguay,* 2 vols. Montevideo, Uruguay Barreiro, 1983. 315 + 309 pp.

This is an extensive biography of Pedro Visca (1840–1912), a French-trained Uruguayan physician who introduced the tenets of classical clinical medicine into the academic curriculum and practice of his day The vivid accounts, supplemented by an impressive original documentation, provide a panoramic view of medicine as taught and practiced in Uruguay during the late nineteenth century In 1868, Visca was the first medical student from a South American country to win a position as an intern in the Parisian hospitals and his activities related to the competition and subsequent clinical rotation are retraced in considerable detail.

RICHARD OLSON *Science Deified and Science Defied: The Historical Significance of Science in Western Culture ca. 3500 B.C. to ca. A.D. 1640.* Berkeley-Los Angeles-London. University of California Press, 1982 xv + 329 pp $32 50 (cloth), $9 95 (paperbound).

This book surveys the relations between science and culture from the ancient Babylonians to Francis Bacon. For each period discussed, the author seeks to determine the role of the broader culture in either promoting or hindering the pursuit of scientific knowledge, the impact of science on the cultural and material life of the age, and, especially, the attitudes toward science that prevailed within the more general culture The author briefly acknowledges (p. 78) the close links between ancient Greek medicine and pre-Socratic philosophy, but otherwise medicine is excluded from his survey. The book is based upon secondary sources, most of which were published before 1970

IRVING EDGAR *A History of Early Jewish Physicians in the State of Michigan.* New York Philosophical Library, 1982. 249 pp. Ill $15 00

The author provides sketches of thirty-three Jewish physicians in Michigan, most of whom either emigrated from Central Europe following the 1848 revolution, from Eastern Europe amidst the pogroms of the late nineteenth and early twentieth centuries, or who were among the first generation of Jewish physicians born and educated in the United States. The chapters vary widely in length and interest, and tend to be hagiographical, but the book includes useful information on the career patterns, civic activities and medical contributions of its subjects.

COLIN C FERGUSON *One Hundred Years of Surgery, 1883–1983: Professors of Surgery, The University of Manitoba.* Winnipeg, Manitoba. Peguis Publishers, 1983 ix + 83 pp Ill $6.00 (Can) (paperbound).

As the author notes, this book "is not a history in the true sense," but rather a series of two- or three-page sketches of the Professors of Surgery at the University of Manitoba There is little information on medical science and practice, and less regarding the broader social context. We do, however, learn such things as "typical of the man, Kerr on his wedding tour attended the 1876 International Medical Congress in Philadelphia." There is some interesting information here, but like this comment, its actual significance is unclear

JULIO RUFFINI (ed) *Advances in Medical Social Science,* vol 2 New York· Gordon and Breach Science Publishers, 1984 xii + 402 pp.

In this second volume, Professor Ruffini brings together eleven more papers on anthropology, sociology, and epidemiology For historians interested in comparative approaches, this collection will be worthwhile One, by Virginia Guess, is specifically about comparative medical systems Another, by Arthur Kleinman, is about clinically applied medical anthropology

THE BULLETIN RECENTLY RECEIVED*

Anales de la Real Academia de Medicine y Cirugía de Cadiz, vol 20, no. 1, 1984. Cadiz, Spain. Royal Academy of Medicine and Surgery of Cadiz, 1984. 92 pp (paperbound).

Aus der Geschichte der Heilkunde. Museum, Bibliothek und Archiv für die Geschichte der Medizin "Ignác Semmelweis" Budapest Hungarian Society for the History of Medicine, Semmelweis Medical Historical Museum, 1984 (Supplement to *Communicationes de Historia Artis Medicinae,* no 13–14) 158 pp. (paperbound).

Otto Baur and Otto Glandien (eds.). *Zusammenhang: Festschrift für Marielene Putscher,* 2 vols. Cologne Wienand Verlag, 1984 1,009 pp.

Phil Brown. *The Transfer of Care. Psychiatric Deinstitutionalization and its Aftermath* London and Boston. Routledge & Kegan Paul, 1985. xvi + 275 pp $22.50.

Francesc Bujosa *La afasia y la polarización ideólogica en torno al sistema nervioso central en la primera mitad del siglo XIX* Valencia. Cátedra de Historia de la Medicina, Universidad de Valencia, 1983 (Cuadernos valencianos de historia de la medicina y la ciencia, monografías, no. 25) 299 pp (paperbound)

Le Cere del Museo dell'Istituto Fiorentino di Anatomica Patologica. Florence· Arnaud Editore, 1984. 272 pp Ill. $50 00 (Distributed by The Owl at the Bridge, 25 Berwick Lane, Cranston, Rhode Island 02905).

Thomas E. Cone, Jr. *History of the Care and Feeding of the Premature Infant* Boston and Toronto. Little, Brown, 1985 xii + 219 pp Ill

Hans Eschebach *Die Arzthauser in Pompeii* Feldmeilen, Switzerland: Raggi-Verlag, 1984 (Supplement to *Antike Welt*) 80 pp. Ill. DM15,80 (paperbound) (Order from Raggi-Verlag, Postfach 113, CH-8706 Feldmeilen, Switzerland).

Gerald L Geison (ed.). *Professions and the French State, 1700–1900.* Philadelphia: University of Pennsylvania Press, 1984. x + 319 pp. $35.00.

Jacques Gelis and Odile Redon (eds.) *Les miracles miroirs des corps* Saint-Denis, France: Presses et Publications de l'Université de Paris VIII—Vincennes à Saint-Denis, 1983. 229 pp Ill. F65,00 (paperbound)

Mary R Glover *The Retreat, York. An Early Quaker Experiment in the Treatment of Mental Illness.* Edited by Janet R. Glover. York, England William Sessions Ltd, 1984 xiv + 106 pp. Ill. £3 95 (paperbound)

Robert A. Hahn and Atwood D Gaines (eds.). *Physicians of Western Medicine Anthropological Approaches to Theory and Practice* Dordrecht-Boston-Lancaster· D Reidel, 1985 (Culture, Illness and Healing, no. 6). ix + 345 pp Dfl. 145,00, $54 00

Esther Hill Hawks. *A Woman Doctor's Civil War Esther Hill Hawks' Diary.* Edited by Gerald Schwartz. Columbia: University of South Carolina Press, 1984. ix + 301 pp. $17.95.

Frederic Lawrence Holmes *Lavoisier and the Chemistry of Life: An Exploration of Scientific Creativity* Madison and London. University of Wisconsin Press, 1985. xxiv + 565 pp. Ill. $38 50.

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* The *Bulletin* reserves freedom of decision as to the publications to be included in this section Items received, other than those reviewed, are ultimately incorporated into the collection of the Institute of the History of Medicine

F Neil Johnson. *The History of Lithium Therapy.* London. Macmillan, 1984 xvii + 198 pp. $49.00 (Distributed in the U S by Oxford University Press, New York)

Victor Johnson *Mayo Clinic Its Growth and Progress* Bloomington, Minnesota· Voyageur Press, 1984. xiv + 369 pp Ill. $17 50

Philip A. Kalisch, Beatrice J Kalisch, and Margaret Scobey *Images of Nurses on Television* New York. Springer Publishing Company, 1983 ix + 214 pp. $22.50

Daniel J Kevles *In the Name of Eugenics Genetics and the Uses of Human Heredity.* New York. Alfred A. Knopf, 1985. 426 pp $22 95

Pearl Kibre *Studies in Medieval Science. Alchemy, Astrology, Mathematics and Medicine.* London and Ronceverte, West Virginia The Hambledon Press, 1984. 376 pp. $40.00.

Fridolf Kudlien et al *Ärzte im Nationalsozialismus* Cologne Kiepenheuer & Witsch, 1985. 310 pp DM48,00

Ellis Pierson Leonard *A Cornell Heritage. Veterinary Medicine, 1868–1908.* Ithaca: New York State College of Veterinary Medicine, 1979. xix + 288 pp Ill $18.50

Ellis Pierson Leonard *In the James Law Tradition, 1908–1948.* Ithaca: New York State College of Veterinary Medicine, 1982. xiii + 342 pp Ill $20 00

Erna Lesky (ed). *Medicina social estudios y testimonios historicos* Translated and introduced by José M López Piñero Madrid. Ministerio de Sanidad y Consumo, 1984 (Colección textos clásicos españoles de la salud pública, supplement 1). 338 pp 2,000 pesetas (cloth), 1,500 pesetas (paperbound).

Charles Lichtenthaeler. *Der Eid des Hippokrates: Ursprung und Bedeutung.* Cologne: Deutscher Ärzte-Verlag, 1984 392 pp DM148,00

Livre des Simples Médecines (facsimile edition with English translation) 2 vols Antwerp De Schutter, 1983 432 + 294 pp Ill Belgian Francs 24,000 (Available in U.S. from Jeremy Norman, 442 Post St., San Francisco, CA 94102)

José María López Piñero. *La ciencia en la historia hispánica* Madrid. Aula Abierta Salvat, Salvat Editores, 1982 (Colección Salvat, Temas Clave). 64 pp Ill (paperbound).

José María López Piñero *La Facultad de Medicina de la Universidad de Valencia: aproximación a su historia.* Valencia: Facultad de Medicina; Universidad de Valencia, 1980. 46 pp. Ill. (paperbound).

José María López Piñero. *La medicina en la historia.* Madrid. Aula Abierta Salvat; Salvat Editores, 1981 (Colección Salvat, Temas Clave). 64 pp Ill. (paperbound)

José María López Piñero and Francesc Bujosa (eds.). *Los tratados de enfermedades infantiles en la España del Renacimiento.* Valencia· Cátedra de Historia de la Medicina, Universidad de Valencia, 1982 (Cuadernos valencianos de historia de la medicina y la ciencia, textos clásicos, no 24) 169 pp (paperbound).

José María López Piñero et al (comps) *Los impresos científicos españoles de los siglos XV y XVI. Inventario, bibliometría y thesaurus* Volume 1, Introduction and listings A–C. Valencia. Cátedra de Historia de la Medicina; Universidad de Valencia, 1981 (Cuadernos valencianos de historia de la medicina y la ciencia, repertorios bibliográficos, no 23). 157 pp. (paperbound).

José María López Piñero et al *Los impresos científicos españoles de los siglos XV y XVI· Inventario, bibliometría y thesaurus.* Volumes 2 and 3, listings D–Q. Valencia. Cátedra de Historia de la Medicina, Universidad de Valencia, 1984 (Cuadernos valencianos de historia de la medicina y la ciencia, repertorios bio-bibliográficos, no. 26) 290 pp. (paperbound).

José María López Piñero and Juan Antonio Micó Navarro (eds.). *Las publicaciones valencianas de Cajal.* Valencia: Universidad de Valencia, 1983 170 pp (paperbound)

Angus McLaren *Reproductive Rituals The Perception of Fertility in England from the Sixteenth Century to the Nineteenth Century.* London and New York. Methuen, 1984. viii + 206 pp $25.00 (cloth); $12.95 (paperbound)

Victor Navarro Brotóns (ed). *La historia de las ciencias y la enseñanza* Valencia: Instituto de Ciencias de la Educación de la Universidad de Valencia, 1980 (Actas del Simposio organizado por la Sociedad Española de Historia de las Ciencias y el Instituto de Ciencas de la Educación de la Universidad Literaria de Valencia, 18–19 abril 1980). 165 pp (paperbound).

Janet Oppenheim. *The Other World Spiritualism and Psychical Research in England, 1850–1914* Cambridge and New York. Cambridge University Press, 1985 503 pp Ill $44 50

Peter Ostwald. *Schumann. The Inner Voices of a Musical Genius* Boston: Northeastern University Press, 1985. 373 pp. $28 00

Charles Newton Peabody. *Zab Brevet Major Zabdiel Boylston Adams, 1829–1902; Physician of Boston and Framingham* Boston. Francis A. Countway Library of Medicine, 1984 xii + 255 pp. Ill. $17 50 (Distributed by the University Press of Virginia.).

Martin S Pernick. *A Calculus of Suffering. Pain, Professionalism, and Anesthesia in Nineteenth-Century America* New York. Columbia University Press, 1985. xiii + 421 pp. $35 00

Philip Rhodes *An Outline History of Medicine* London and Boston Butterworths, 1985 219 pp. $19.95 (paperbound).

James L. Rice. *Dostoevsky and the Healing Art An Essay in Literary and Medical History* Ann Arbor, Michigan. Ardis, 1985 xviii + 352 pp. $30 00

Robert I Rotberg and Theodore K. Rabb (eds). *Hunger and History The Impact of Changing Food Production and Consumption Patterns on Society* Cambridge and New York: Cambridge University Press, 1985 (reprinted from *Journal of Interdisciplinary History,* 1983, vol. 14). 336 pp $34 50 (cloth), $11.95 (paperbound)

Detlef Rüster *Alte Chirurgie. Legende und Wirklichkeit* East Berlin VEB Verlag Volk und Gesundheit, 1985. 256 pp Ill DM32,00

Ann-Louise Shapiro. *Housing the Poor of Paris, 1850–1902* Madison and London. University of Wisconsin Press, 1985 xx + 224 pp. Ill. $32.50.

Friedrich Trendelenburg *From My Joyful Days of Youth A Memoir.* Translated by Abbou Elka and Colon Dominique with a preface by Guenter B Risse Cairo Al-Ahram Publishing House, 1984. x + 289 pp $10 00; $20 00 (outside U.S.) (Distributed by the National Technical Information Service, Springfield, Virginia 22151, #PB 84-169093).

D Tutzke, K.-J Burmeister, R. Lange-Pfautsch and G Brüschke *Charité, 1710–1985.* East Berlin: VEB Verlag Volk and Gesundheit, 1985. 79 pp Ill DM35,00 (paperbound).

Edwin R. Wallace, IV. *Historiography and Causation in Psychoanalysis An Essay on Psychoanalytic and Historical Epistemology* Hillsdale, NJ. The Analytic Press, 1985. xv + 285 pp. (Distributed by Lawrence Erlbaum Associates)

Ronald Winton. *A'Body's Body: The First Twenty-One Years of the Royal Australian College of General Practitioners* Sydney Royal Australian College of General Practitioners, 1983. xii + 92 pp. Ill.

CONTRIBUTORS TO THIS NUMBER

JAMES H. CASSEDY, Ph.D, is a Historian at the National Library of Medicine, 8600 Rockville Pike, Bethesda, Maryland 20209 He edits the Library's annual *Bibliography of the History of Medicine* and is presently completing the third volume in his history of American medical demography and statistics

LUKE DEMAITRE, Ph.D, teaches history at Pace University in Pleasantville, New York. He has published a book and several articles on medical theory and practice in the Middle Ages and is currently preparing a study of care in old age in medieval and Renaissance medicine His address is 112 Westerly Street, Yonkers, New York 10704

JOHN R. GUY, Ph D, is Archivist at the Marsh-Jackson Postgraduate Medical Centre, Yeovil District Hospital, Higher Kingston, Yeovil BA21 4AT, England and the author of short histories of two provincial hospitals—Yeovil (1983) and Crewkerne (1984).

RUTH LEYS, Ph.D., is a historian working in the general area of the history of psychiatry, psychoanalysis, and psychology The present article is part of a larger project on the work and career of Adolf Meyer She is also working with Rand B Evans on a critical edition of the correspondence between Adolf Meyer and E. B Titchener Her address is: The Humanities Center, The Johns Hopkins University, 34th and Charles Streets, Baltimore, Maryland 21218

ROBIN MURRAY PRICE, M.A., A.L.A., is Deputy Librarian and the Curator of the American Collections, Wellcome Institute for the History of Medicine, 183 Euston Road, London NW1 2BP, England His publications include *An Annotated Catalogue of Medical Americana in the Library of the Wellcome Institute for the History of Medicine* (1983) and papers on aspects of Hispanic colonial medicine.

MARGARET WARNER, Ph.D., is a student at the Harvard Medical School and a graduate of the History of Science Department, Harvard University In addition to studying clinical medicine, she is currently revising her doctoral thesis on the history of yellow fever and public health in the late nineteenth-century American South Her address is 107 Avenue Louis Pasteur, #271, Boston, Massachusetts 02115

JAMES R. WRIGHT, JR., M.D., is a resident in pathology at Barnes Hospital in St. Louis His prize-winning essay was written while he was a medical student at Ohio State University His address is Department of Pathology, Washington University School of Medicine, 660 South Euclid Avenue, St. Louis, Missouri 63110.

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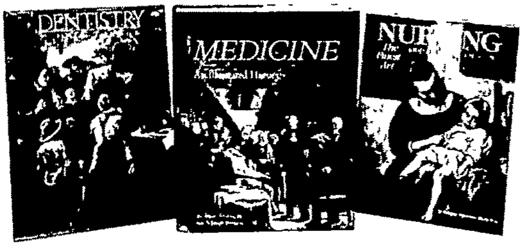

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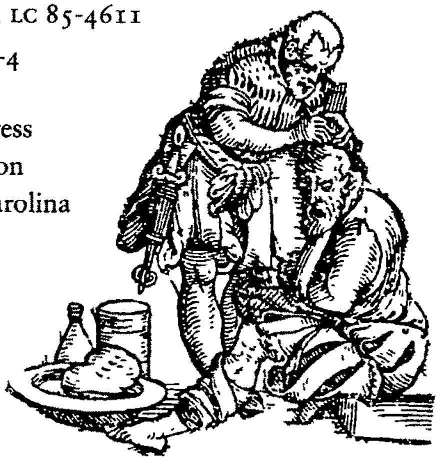

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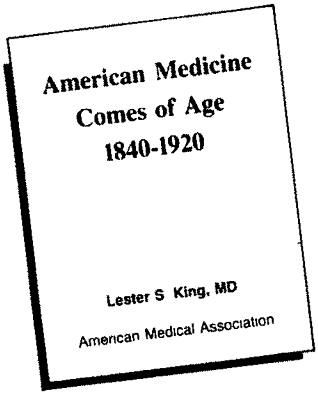

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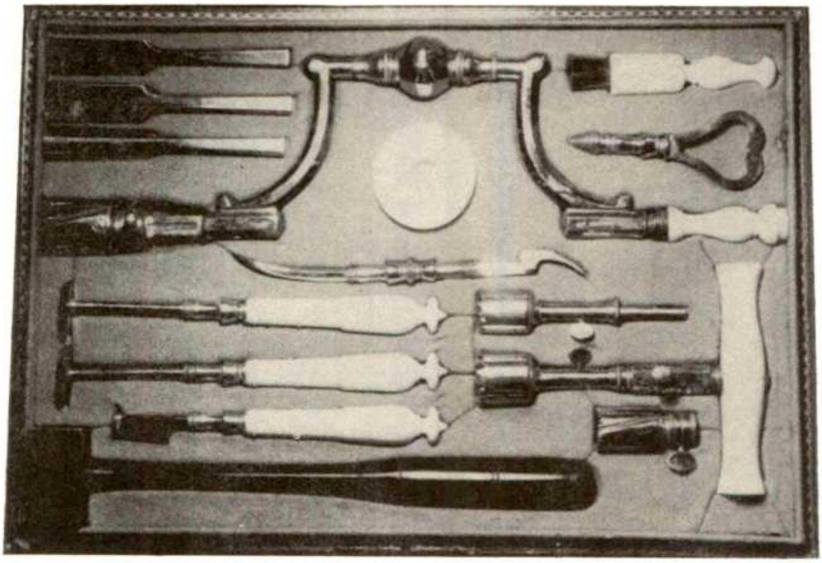

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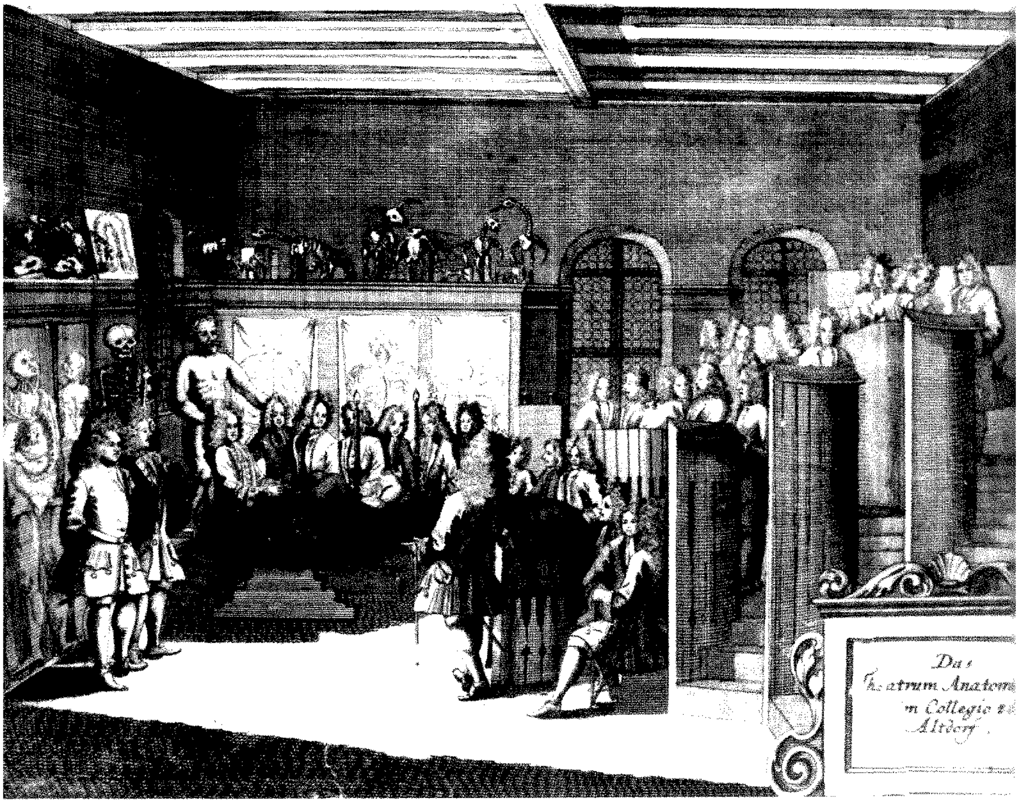

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ROCKY MOUNTAIN SPOTTED FEVER RESEARCH AND THE DEVELOPMENT OF THE INSECT VECTOR THEORY, 1900–1930*

Victoria A. Harden

At the beginning of the twentieth century, reports began to appear in the medical literature about a new and virulent disease that occurred in a remote mountain valley in western Montana. Sometimes misdiagnosed as cerebrospinal meningitis, this malady came to be known as Rocky Mountain spotted fever.[1] Early research into the cause of spotted fever implicated the Rocky Mountain wood tick as the means by which the disease was transmitted. A number of investigations into the relationship between such arthropods and disease had been conducted in the nineteenth century by researchers in bacteriology, veterinary medicine, zoology, and public health. These scientists had sought to identify diseases carried by arthropod vectors, to explain how transmission occurred, and even to predict what sort of diseases particular vectors could be expected to carry. Subsequent inquiries into these problems, however, revealed that arthropod transmission of disease was more complex than early workers had envisioned This paper will examine how research into Rocky Mountain spotted fever contributed to a fuller articulation of the arthropod vector concept.

The notion that insects might be related to disease existed in folk beliefs for centuries before scientists sought evidence to prove it.[2] The connection was not confirmed until the late nineteenth century when the germ theory of disease was advanced and insects were shown to be one means by which pathogenic microorganisms were spread. The term "insect vector" is, of

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* Quotations from the Howard Taylor Ricketts Papers are used by permission of the Department of Special Collections, Joseph Regenstein Library, University of Chicago, Chicago, Illinois I would also like to thank James H Cassedy, National Library of Medicine, Alan W Cheever, Laboratory of Parasitic Diseases, National Institute of Allergy and Infectious Diseases, and Professor Emeritus James Harvey Young, Emory University, for helpful comments on an early draft of this paper

[1] The *Journal of the American Medical Association* reported an epidemic of spotted fever in 1902 which it identified as cerebrospinal meningitis See "The 'spotted fever' epidemic," *JAMA*, 1902, *38* 1313

[2] Hugo G Rodeck, "Arthropod designs on prehistoric Mimbres pottery," *Annals Entomol Soc America*, 1932, *25* 688–93, George F Weisel, "Animal names, anatomical terms, and some ethnozoology of the Flathead Indians," *J Washington Acad Sci*, 1952, *42* 345–55 See also surveys of the development of the insect vector theory in William B Herms and Maurice T James, *Medical Entomology*, 5th ed (New York Macmillan, 1961), pp 2–9, Cornelius B Philip and Lloyd E Rozeboom, "Medico-veterinary Entomology A Generation of Progress," in Ray F. Smith, Thomas E. Mittler, and Carroll N Smith, eds, *History of Entomology* (Palo Alto, Calif Annual Reviews, 1973), pp 333–59, and L O Howard, "A Fifty Year Sketch History of Medical Entomology and its Relation to Public Health," in Mazyck P Ravenel, ed, *A Half Century of Public Health* (New York. American Public Health Association, 1921), pp 412–38

Bull Hist Med., 1985, *59* 449–466

course, partially a misnomer, since insects represent only one class of arthropods that carry disease. Other arthropod vectors of importance are ticks, mites, and crustaceans.

Investigations of the connection between arthropods and disease emerged from two productive lines of scientific investigation in the nineteenth century. One was bacteriology, which entered its heroic period of discovery after 1877, when Robert Koch and Louis Pasteur independently demonstrated that anthrax was caused by a particular microorganism. An important question that confronted bacteriologists was how pathogenic bacteria were transferred from host to host. This problem led to investigations of water, milk, and human carriers as well as to the recognition of insect and other arthropod vectors. Transmission of bacterial diseases by insects was believed to be a mechanical process· the insect accidentally picked up bacteria on its wings, feet, or mouth parts and carried it to food or other items contacted by a human or animal host. The Spanish American War of 1898 produced a convincing and well publicized indictment of one insect, the house fly, in connection with the mechanical transmission of a specific disease, typhoid fever. An official investigation of the typhoid epidemic in American camps documented the proximity of open latrines to cooking tents in the camps, noted the swarms of flies with access to both, and concluded that authorities concentrating on the purity of water supplies had neglected to address the threat of transmission of typhoid by flies.[3]

A second line of inquiry about arthropods and disease grew out of research in helminthology, the study of parasitic worms.[4] A number of suggestive studies were made after 1850 connecting insects with helminths, but much of the credit for the rapid progress toward the end of the century is usually accorded to the British military physician Patrick Manson. His studies were directed at elucidating the life cycle of *Filaria bancrofti,* the worm that causes the tropical disease filariasis. In the course of this work, Manson discovered that a portion of the worm's life cycle had to be spent in the body of a mosquito.[5] Manson's research was most significant because of the inspiration it provided for Ronald Ross, another physician in the British military.[6] In 1898 Ross completed experiments suggested by Manson that demonstrated the presence of the malaria parasite in the mid-guts of *Anopheles* mosquitoes. Although credit for this discovery was shared with the Italian investigator Giovanni Battista Grassi and his collaborators, Ross reaped high honors in England. Fellowship in the Royal Society in 1901 and knighthood in 1918 followed the realization that mosquito control measures might rid the world of the scourge of malaria and improve the habitability of Britain's tropical colonies.[7]

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[3] Walter Reed, Victor C Vaughn, and Edward O Shakespeare, *Report on the Origin and Spread of Typhoid Fever in US Military Camps During the Spanish War of 1898* (Washington, D C US Government Printing Office, 1904), M.A. Veeder, "Flies as spreaders of disease in camps," *N Y Med Rec*, 17 September 1898, pp 429–30, William B Bean, *Walter Reed A Biography* (Charlottesville University Press of Virginia, 1982), pp 87–91, Edward F Keuchel, "Chemicals and meat the embalmed beef scandal of the Spanish-American War," *Bull Hist Med*, 1974, *48* 249–64

[4] William D Foster, *A History of Parasitology* (Edinburgh E & S Livingstone, 1965), *passim*

[5] Patrick Manson, "On the development of *Filaria sanguinis hominis,* and on the mosquito considered as a nurse," *J Linnean Soc*, 1878, *14* 304–11 This worm was later renamed *Wuchereria bancrofti*

[6] Howard, "Fifty Year Sketch," p 413

Five years before Ross's achievement, Theobald Smith and F. L. Kilbourne, a physician and a veterinarian working in the Bureau of Animal Industry of the United States Department of Agriculture, published the results of their collaborative experiments on Texas cattle fever They proved conclusively that this disease, which caused a significant economic loss to the owners of the afflicted cattle, was caused by the presence in the blood of a protozoan organism that had been transmitted to the cattle by the bite of an infected tick.[8] Moreover, they demonstrated that dipping cattle to kill ticks would effectively prevent the disease.

The disease organisms of filariasis, malaria, and Texas cattle fever spent some portion of their life cycles developing in the body of an intermediate arthropod host, which passed them on to humans or animals through direct inoculation by biting This developmental phenomenon, not shared by bacteria, defined initially the concept of biological transmission of disease by arthropods. Pathogenic helminths and protozoa, moreover, could not be cultured as bacteria were. The discovery that microorganisms other than bacteria could be sources of disease offered an explanation for a major problem besetting bacteriologists. Robert Koch had included as one of his three postulates for demonstrating bacterial etiology of disease the isolation and culture on an artificial medium of the suspected organism. Attempts to culture the organisms of yellow fever, rabies, and several other diseases had proven fruitless, but after the discoveries of Manson, Ross, and Smith and Kilbourne, many researchers suspected that the elusive organisms of a number of dread diseases were pathogenic protozoa or helminths.[9] When the U.S. Yellow Fever Commission in Cuba demonstrated that Yellow Jack was a mosquito-borne disease, this suspicion became a working hypothesis [10]

Accompanying these scientific discoveries was the differentiation and professionalization of distinct scientific disciplines. Those researchers who dealt primarily with diseases transmitted biologically by arthropods had, in general, strong backgrounds in zoological subjects—helminthology, protozoology, and entomology. They came to identify themselves as "parasitologists," and, in order to obtain funds for their work, they sought to justify intellectually the distinctiveness of their discipline.[11] From these efforts emerged a theoretical model that, among other things, purported to define the relationship between disease organisms and their arthropod vectors. Patrick Manson, for example, drew a distinction between "cosmopolitan" diseases and "diseases of limited geographical range." The former, he argued, "can be acquired anywhere or everywhere," while the latter were confined to a particular geographic location.[12] Furthermore, he contended that, with few exceptions, cosmopolitan diseases were bacterial in origin, while the diseases of limited geographical range were entozoal—that is, caused by helminth or protozoan parasites whose habitat was any of the internal organs or tissues. George H. F. Nuttall, founder of the journal *Parasitology,* refined the distinction between bacterial and entozoal diseases. Adhering to the larger biological division that separated all living things into plants and animals, Nuttall defined bacteria as plants—"vegetable parasites"—and protozoa as animals—microscopic relatives of the helminths.[13]

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[7] H Harold Scott, *A History of Tropical Medicine,* 2 vols (London Edward Arnold, 1939), 2 1086–90

[8] Theobald Smith and F L Kilbourne, "Investigations into the nature, causation and prevention of Texas or southern cattle fever," U S Department of Agriculture, Bureau of Animal Industry *Bulletin* no 1 (1893)

[9] Sally Smith Hughes, *The Virus A History of the Concept* (New York Science History Publications, 1977), pp 12, 17–21

[10] Howard A. Kelly, *Walter Reed and Yellow Fever,* 3rd rev ed (Baltimore Norman, Remington, 1923) presents an admiring study of Walter Reed's work on yellow fever and also discusses his work on typhoid in the Spanish American War, see also William B Bean, "Walter Reed and the ordeal of human experiments," *Bull Hist Med*, 1977, *51* 75–92 Papers published by the members of the Yellow Fever Commission are bound together in U S Congress, Senate, *Yellow Fever A Compilation of Various Publications Results of the Work of Maj Walter Reed, Medical Corps, United States Army, and the Yellow Fever Commission,* 61st Cong, 3d sess, 1911, S Doc 822 Evidence of the assumption that yellow fever was a protozoan disease may be seen in Herman B Parker, George E Beyer, and O L Pothier, "Report of working party no 1, Yellow Fever Institute a study of the etiology of yellow fever," U S Public Health and Marine Hospital Service, *Yellow Fever Institute Bulletin,* 1903, no 13

Working from such definitions, parasitologists could state that the diseases for which a cause was known and which were transmitted biologically by arthropod vectors were all protozoal or helminthic while those transmitted mechanically were primarily bacterial. Most of these scientists never concluded that this must always be the case, but in the face of no conflicting evidence, they often came to assume these relationships as truth. In 1899, for example, Nuttall published the first exhaustive study of arthropod vectors. Simply by focusing on known information and adopting a skeptical attitude about alternative hypotheses, Nuttall reinforced such assumptions. In his section on ticks, he discounted the likelihood that these arthropods carried any sort of bacterial infection biologically, but he discussed at length tick transmission of protozoan diseases, especially Texas cattle fever.[14]

It was Charles Wardell Stiles in the United States who dared to draw the conclusion openly. Stiles had studied bacteriology with Robert Koch, but he took his Ph.D. in zoology in 1890 with the distinguished Leipzig helminthologist Rudolph Leuckart, and his interests lay in zoological subjects.[15] He returned to the United States in 1891 to become principal zoologist for the U.S. Bureau of Animal Industry, where he worked alongside Theobald Smith and F. L. Kilbourne. Stiles was also a professor of medical zoology at Georgetown University from 1892 to 1906, and in April 1901 he presented the annual Toner Lecture at Georgetown on the subject "Insects as Disseminators of Disease."[16] In this lecture he postulated that the connection between disease organisms and their means of transmission by arthropods was fixed. He stated:

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[11] There is no full scale study of the development of parasitology as a discipline A brief account that analyzes the social and economic factors involved is Michael Worboys, "The Emergence and Early Development of Parasitology," in Kenneth S Warren and John Z. Bowers, eds,, *Parasitology A Global Perspective* (New York Springer-Verlag, 1983), pp 1–18

[12] Patrick Manson, "The London School of Tropical Medicine," *J Trop Med*, 1899, *2* 57

[13] Worboys, "Emergence and Early Development of Parasitology," p 10

[14] George Henry Falkner Nuttall, "On the role of insects, arachnids, and myriapods as carriers in the spread of bacterial and parasitic diseases of man and animals a critical and historical study," *Johns Hopkins Hosp Reports,* 1899, *8* 43–49, 71–75

> We may lay down two general biologic rules, which, I believe, are enunciated tonight for the first time: *The First rule, to which at present a few exceptions are known, is that diseases which are* accidentally *spread by insects are caused by parasitic* plants, *particularly by bacteria The second, to which no exceptions are as yet known, is that those diseases which are* dependent *upon insects or other arthropods for their dissemination and transmission are caused by parasitic* animals, *particularly by sporozoa and worms* [17]

This model of how nature operated was powerful in suggesting what sort of disease to suspect given a known insect vector. House flies, for example, were known to carry bacterial diseases, but ticks and mosquitoes should be suspected of carrying protozoal diseases Conversely, if a disease was of known bacterial origin, accidental transmission by an insect should be investigated, while if a protozoan or helminth had been identified, an arthropod that transmitted the disease biologically might be the likely culprit.

Stiles applied his principles to arguments then current about the mode of transmission of bubonic plague He began with the fact that plague was a bacterial disease. Since this was the case, he argued that fleas—known to be connected with plague—probably transmitted the disease accidentally. "Suppose the flea," he said,

> succeeds in reaching a healthy person, and the latter, in an attempt to allay the irritation caused by his unwelcome visitor, scratches himself and at the same time crushes the flea The possibility is present that some of the germs from the intestine of the insect will be rubbed into the fresh scratch, and thus bring about the disease, or, since fleas deposit their excreta on the skin of their victims, the possibility is present that the germs enter the system by way of the wound caused by the flea bites, instead of by the act of biting on the part of the flea.[18]

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[15] There are many biographical articles on Stiles, including James H Cassedy's sketch of him in the *Dictionary of American Biography* (New York Charles Scribner's Sons, 1928–80), supplement 3 (1973), ed Edward T James, pp 737–39, and an autobiographical article, "Early history, in part esoteric, of the hookworm (Uncinariasis) campaign in our southern U S," *J Parasitology*, 1939, *25* 283–308

[16] Charles Wardell Stiles, "Insects as disseminators of disease," *Virginia Med Semi-Monthly*, 1901, *6* 53–58

[17] *Ibid*, p 54 Stiles's italics

[18] *Ibid*, p 55

Stiles's conjecture was correct: bubonic plague may be transmitted as he supposed The principal means of transmission, however, is through the bite of an infected flea in which plague bacteria have multiplied. In such a case, the arthropod is said to be an obligatory biological vector of the disease. For bubonic plague this mechanism had been proposed in 1898 but not proven conclusively.[19]

The construction of this model defining the relationship of insects to disease played a key role for a time in how researchers approached newly identified diseases. In particular, it affected the perception of early investigators of Rocky Mountain spotted fever, a disease that came to the attention of the United States medical community at the beginning of the twentieth century.

Rocky Mountain spotted fever is a disease caused by organisms that must inhabit living cells in order to multiply and whose pathogenic mechanism remains something of a mystery. Spotted fever organisms are found in ticks, are transmitted from generation to generation in the eggs of the female, and are in nature passed to non-infected ticks through small rodents that become reservoirs for the disease when bitten by an infected tick. Humans are not required to maintain the organism in nature and are accidental hosts in the natural cycle. Victims of spotted fever characteristically have a high fever, intense frontal headache, and muscle and joint pains. The most recognizable diagnostic sign is a rash that begins on the wrists and ankles and spreads to the trunk of the body. The mottled red appearance of the rash turns blue-black as the disease progresses. One peculiar feature of spotted fever is that the mortality of cases varies enormously from locality to locality.[20]

The first published report identifying spotted fever as a distinct disease was made in 1896 by a U.S. Army physician.[21] In this report and in the first civilian paper written about the disease in 1899, the cases described had occurred in Idaho and had a prognosis that was "as a rule, quite favorable."[22] An exceptionally virulent form, however, occurred in the Bitterroot Valley of Montana, which is located in southwestern Montana along the border with Idaho. Within the valley, moreover, the virulent form of the disease was confined to the western side of the Bitterroot River. Inhabitants gave the disease descriptive names taken from the appearance of the rash. "Black measles," "blue disease," and "spotted fever" were the most common names for this malady, which occurred most frequently from April through late June.

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[19] Paul Louis Simond, "La propagation de la peste," *Annals Inst Pasteur*, 1898, *12* 625–87, Nuttall noted that Simond did not actually claim biological transmission but suggested it strongly Nuttall was highly skeptical of this theory. See "On the role of insects," pp 18–21 Arguments regarding the flea as a biological vector of plague applied only to the bubonic form of the disease The pneumonic form is spread through the air when an infected person coughs or sneezes

[20] James W Moulder, "Rickettsiae," in Bernard D Davis et al , eds , *Microbiology*, 2nd ed. (New York Harper & Row, 1973), pp 908–9

[21] Marshall W. Wood, "Spotted Fever as Reported from Idaho," U S War Department, *Report of the Surgeon General of the Army to the Secretary of War, 1896* (Washington, D C , 1896), pp 60–65

[22] Edward E Maxey, "Some observations on the so-called spotted fever of Idaho," *Medical Sentinel*, 1899, 7 438

Virulent spotted fever had been known in the Bitterroot since about 1873, when control of the valley was passing from Indian to white.[23] About 200 cases were believed to have occurred since 1873, and among the 114 cases for which records existed, spotted fever had exacted a mortality of just over 70 percent In some years, however, mortality ran as high as 100 percent[24] By the turn of the century, the population of the valley was approaching 8,000, apple orchards had been cultivated successfully, and land promoters hoped to sell acreage in the spectacular valley to buyers in Chicago and other urban areas.[25] An expanding population, however, meant more potential victims of the disease. Economic aspirations thus created pressure for "something to be done" about spotted fever Although victims of the disease numbered only a dozen or two each year, spotted fever inspired justifiable fears of an early and horrible death and produced an overwhelming public outcry.

Along with other states at about this time, Montana, in April 1901, created a State Board of Health. Smallpox was epidemic in 1901—448 cases were reported in the state in a six-month period. Controlling this problem alone would have strained the meager $2,000 per year budget of the Board, but because of public pressure, spotted fever was the premier problem assigned by the governor to the Board.[26] Preliminary epidemiological and clinical investigations were conducted in 1901, but it was clear that the work needed to be placed on a more scientific basis.

During the spring of 1902, the State Board of Health hired Louis B. Wilson, Minnesota State Pathologist, and William M. Chowning, a pathologist at the University of Minnesota, to investigate the disease. After exhaustive epidemiological, pathological, and hematological work, Wilson and Chowning reported that no bacteria could be cultured from the blood of patients, so they ruled out bacterial causation. Instead, they announced that in the red blood corpuscles of spotted fever victims they had found a "hematozoan," a protozoan parasite that lived all or a part of its life cycle in the circulating blood of its host. This particular hematozoan, they identified as a "piroplasma," other species of which caused Texas cattle fever and similar blood diseases in horses and dogs They described three phases in which they found the organism, which they said varied in size from one to three microns in thickness and from two to five microns in length.[27] This piroplasma, they stated, resembled

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[23] Montana State Board of Health, *First Biennial Report From Its Creation March 15th, 1901 to November 30, 1902* (Helena, [1903]), p 30

[24] Report of the work of Louis B Wilson and William M Chowning in *ibid*, pp 28–41. Wilson and Chowning also published a summary of this report as "The so-called 'spotted fever' of the Rocky Mountains," *JAMA*, 1902, *39* 131–36

[25] The population figure is taken from Montana State Board of Health, *Sixth Biennial Report of the State Board of Health of Montana and Third Biennial Report of the State Registrar of Births and Deaths, 1911–1912* (Helena, [1913]), Table 9, p 146 On the history of the Bitterroot Valley, see S L Cappious, "History of the Bitter Root Valley to 1914" (M A thesis, University of Washington, 1939), Robert William Hadlow, "The big ditch and the McIntosh red. early boosterism in Montana's Bitter Root Valley," *Pacific Northwest Forum*, 1983, *8(4)* 2–13 The words "Bitter Root" have been combined officially in recent years References to the valley in the period under discussion invariably used the two-word form

[26] Montana State Board of Health, *First Biennial Report, 1901–1902*, pp 4–9

> in its smaller form very markedly the Pyrosoma bigeminum of Texas fever, yet [it] differs from that organism in being larger, and in its larger forms exhibiting active ameboid movements with the projection of pseudo-podia The absence of pigment from the organism of "spotted fever" would apparently separate it from the malarial group and place it with that of Texas fever[28]

Based on this finding as well as on epidemiological work that showed the incidence of the disease to be greatest in the spring of the year, Wilson and Chowning argued that the tick was probably the mode of infection for humans and that the local ground squirrel was a likely mammalian reservoir. They said. "All hematozoa of warm-blooded animals, of which the life cycle is now known, pass at least one phase of their development within the body of some host (usually an insect or arachnid) other than the one whose blood cells they invade. This is probably also true of the hematozoan of 'spotted fever' "[29] They also noted that in both malaria and Texas fever, only one species of mosquito or tick carried the organism and that within that species not all members were infected. This comment was offered to explain the low incidence of infection among inhabitants of the Bitterroot, because, as the local people noted, it was impossible to escape being bitten during "tick season" each spring.

The findings of Wilson and Chowning were entirely consistent with the prevailing assumptions about insects and disease. The discovery of a "piroplasma" indicated a possible arthropod vector, and the abundance of ticks during the season in which the disease most frequently occurred implied that they were the vectors. In 1902 and 1903 the U.S. Public Health and Marine Hospital Service sent investigators to the Bitterroot, and both of them confirmed Wilson and Chowning's research. The presumed similarity of spotted fever with malaria also suggested treatment with quinine[30]

Unfortunately, spotted fever cases continued to occur, and quinine therapy did not save many victims The Montana State Board of Health had no more money for further investigations, so an appeal was made to the Public Health and Marine Hospital Service for another investigator. In 1904 the Surgeon General sent his most knowledgeable worker in the area of protozoal diseases—Charles Wardell Stiles. Stiles had left the Bureau of Animal Industry in August 1902 to become the first director of the newly created Division of Zoology in the Hygienic Laboratory of the Public Health and Marine Hospital Service.[31] His already solid reputation had been further reinforced in May of that year when he identified a new species of hookworm and correctly deduced that it rather than malaria caused the anemia prevalent in the southern United States. For this work he came to be hailed as the discoverer of the "Germ of Laziness."[32] Surgeon General Walter Wyman hoped that his eminent zoologist could trace the life cycle of the protozoan of spotted fever, study the tick which transmitted it and the ground squirrels which harbored the disease in nature, and arrive at a workable means of preventing the disease.[33]

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[27] Louis B Wilson and William M Chowning, "Studies in Pyroplasmosis hominis 'spotted fever' or 'tick fever' of the Rocky Mountains," *J Infect Diseases,* 1904, *1* 47 Their original spelling "pyroplasmosis" was later corrected to "piroplasmosis" to conform with accepted zoological terminology

[28] Montana State Board of Health, *First Biennial Report, 1901–1902,* p 82

[29] *Ibid*, p 83

[30] J O Cobb, "The so-called 'spotted fever' of the Rocky Mountains—a new disease in the Bitter Root Valley, Mont," *Pub Health Rep*, 1902, *17* 1868–70, John F Anderson, "Spotted fever (tick fever) of the Rocky Mountains—a new disease," U S Hygienic Laboratory *Bulletin* no 14 (July 1903) Anderson's work was also published in Montana State Board of Health, *Second Biennial Report of the Montana State Board of Health From December 1, 1902 to November 30, 1904* (Helena, [1905]), pp 123–58 The suggestion for treatment with quinine is in Anderson, "Spotted fever," p 40, Montana State Board of Health, *Second Biennial Report, 1902–1904,* p 156

Stiles worked in the Bitterroot Valley from 7 May to 6 July 1904. During that time he saw ten patients, drew blood samples from nine, and attended an autopsy on one.[34] He admitted that initially he had been favorably impressed by the protozoan and tick transmission theory of Wilson and Chowning, but his work in the Bitterroot completely changed his mind.[35] After more than a hundred hours of work with the microscope, he could find no trace of the reported organism in the blood of victims. In this work he was joined by a U.S Army physician, Percy M Ashburn, who corroborated Stiles's findings that no piroplasma were present. Moreover, neither of them could find the organism in slides sent to them by Wilson and Chowning, nor could Chowning, who was in the Bitterroot Valley at the time, demonstrate one to them. "Accordingly," Stiles wrote, "the work of 1904 has failed to confirm the conclusions of 1902 and 1903, and indications are not lacking that at least some of the stages of the supposed *Piroplasma hominis* consist in reality of vacuoles, blood platelets, blood dust, artifacts, and tertian malaria parasites."[36]

The evidence seemed overwhelming that no protozoan parasite was present. Such organisms, however, were often difficult to find under the microscope, so Stiles attempted to determine the presence of the organism by indirect means—by comparing symptoms of spotted fever with symptoms of known piroplasmic maladies, especially Texas cattle fever. When he applied his wide knowledge of piroplasmic diseases in a comparison with spotted fever, however, he found few similarities. Most known piroplasmic diseases, for example, flourished in swampy valleys, but spotted fever occurred in the foothills of the Bitterroot Mountains.[37] Piroplasmic diseases were also "apt to attack large numbers of patients at about the same time in the same locality," he noted, and "if 'spotted fever' is a piroplasmosis, transmitted by a tick, we should expect a large number of cases to develop in any locality in which one case develops. This, however, is exactly what we do not find in 'spotted fever.' "[38] This observation, he admitted, "was the first point to lead me to seriously doubt the tick hypothesis"

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[31] On the reorganization of the Public Health and Marine Hospital Service and on Stiles's role as director of the Division of Zoology, see Victoria A. Harden, "Toward a National Institute of Health The Development of Federal Biomedical Research Policy, 1900–1930" (Ph D diss , Emory University, 1983), pp 111–14, 125–27

[32] For accounts of Stiles's work with hookworm, see Stiles, "Early history of the hookworm," James H Cassedy, "The 'germ of laziness' in the South, 1900–1915 Charles Wardell Stiles and the Progressive paradox," *Bull Hist Med*, 1971, *45* 159–69, John Ettling, *The Germ of Laziness Rockefeller Philanthropy and Public Health in the New South* (Cambridge, Mass Harvard University Press, 1981)

[33] Charles Wardell Stiles, "A zoological investigation into the cause, transmission, and source of Rocky Mountain 'spotted fever,' " U S Hygienic Laboratory *Bulletin* no 20 (April 1905), p 10

[34] *Ibid*, p 11, U S Treasury Department, *Annual Report of the Surgeon General of the United States Public Health and Marine Hospital Service, 1904* (Washington, D C , 1904), p 362 Hereinafter cited as PH-MHS *Annual Report, 1904*

[35] Stiles, "Zoological investigation," p 11

[36] *Ibid*, pp 7, 19, PH-MHS *Annual Report, 1904,* pp 362–63

Stiles continued on, comparing one point after another about spotted fever and known piroplasmoses. He noted that no known protozoan disease was characterized by a rash but that in spotted fever the rash was the principal diagnostic sign. Victims of piroplasmosis normally became emaciated; victims of spotted fever appeared well nourished. In Texas fever, the organism caused the blood to become "thin, watery, and pale," while the blood of spotted fever victims became "thick, molasses like, and dark." The bile in piroplasmosis became thickened, but in spotted fever the bile remained fluid.[39] Stiles concluded that the disease was not a piroplasmosis. The tick transmission theory of spotted fever and its corollary, the ground squirrel host, were totally dependent, in Stiles's thinking, on the presence of protozoan organisms. He stated.

> An important point upon which I desire to place considerable stress is that the tick theory is a secondary hypothesis based upon the idea that "spotted fever" is caused by a protozoon If the *Piroplasma* theory is correct, the tick theory immediately receives a very strong argument in its favor, for other species of *Piroplasma* are known to have ticks as their intermediate host[40]

From his work in 1904, Stiles concluded that the earlier investigators had been wrong about the causative organism, about the tick transmission theory, and about the ground squirrel host. His own investigation, however, yielded entirely negative results, for he produced "no new theories ... regarding the cause, transmission, and origin of this disease."[41]

Stiles had no new evidence about the cause of the disease, but he offered some speculation about alternative causes that was, as he said, "in accord with the generally accepted view" regarding arthropods and disease[42] If spotted fever were not a protozoan disease, he reasoned, it must be a bacterial disease. If it were bacterial, it would likely be contagious. Noting that not all cases reported a history of tick bite and that there were instances in which more than one member of a family had succumbed to the disease, he speculated that contagion might be present. "[I]t seems to me," he wrote, "that the possibility is by no means excluded that, despite the general experience regarding the noncontagiousness of the disease, such close intimacy as sleeping in the same bed might perhaps result in a transmission of the disease to a healthy individual."[43]

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[37] Stiles, "Zoological investigation," p 29
[38] *Ibid*, p 30
[39] *Ibid*, pp 8, 49, 65
[40] *Ibid*, p. 20 Both spellings, "protozoan" and "protozoon," occur in the published literature at this time
[41] Stiles, "Zoological investigation," p 10

Stiles also attempted to explain the seasonal occurrence of the disease within the existing theoretical framework. "Practically all authors lay stress upon the fact that the affection under discussion is preeminently a disease of the spring months," he wrote.[44] He did not, however, relate the emergence of ticks to the increased warmth of the spring months, but he did note the connection between spring warming and a rise in the amount of water in streams from melted snow. In fact, he revived a prevailing folk theory that spotted fever had something to do with drinking melted snow water. "[S]uch as the data are," he said, "they tend to support rather than to negative [*sic*] the popular idea that the melting snow has some direct or indirect connection with the development of cases, or . . . that conditions which favor the melting of the snow also favor the appearance of cases of spotted fever."[45]

Upon his return to Washington, Stiles published the most lengthy report on spotted fever yet produced. In addition to his conclusions, he added an observation at the end of the report that would be used to question his integrity in later years. He said.

> The tick theory has caused serious financial loss to the Bitter Root Valley and has produced an effect which in a few cases bordered on hysteria. In justice to the property interests of the valley and the peace of mind of the inhabitants, I think no time should be lost in publishing the statement that the results of study this year have absolutely and totally failed to confirm this hypothesis[46]

This statement inspired one author writing about spotted fever to suggest that Stiles succumbed, at least unconsciously, to pressure from Bitterroot residents who feared that their property values would fall should the tick theory prove to be correct.[47] Such an interpretation misses the clear intellectual motivation behind Stiles's rejection of the tick hypothesis and ignores the responsibilities of government scientists in the Progressive Era.

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[42] *Ibid*, p 44

[43] *Ibid*, p 23

[44] *Ibid*, p 32

[45] *Ibid*, p 35

[46] PH-MHS *Annual Report, 1904*, p 363 Stiles's summary report also appeared in Montana State Board of Health, *Second Biennial Report, 1902–1904*, pp 160–62 The quotation is from p 162

[47] Esther Gaskins Price, *Fighting Spotted Fever in the Rockies* (Helena, Montana Naegele Printing, 1948), pp. 34–36

Stiles, like other employees of government agencies, had to be responsive to the concerns of his employers—the taxpayers of the United States. As James H. Cassedy has noted in his analysis of Stiles's hookworm activities during this same period, such an awareness did not compromise a scientist's integrity, but it made him think twice before publishing findings that could have a potentially negative economic impact.[48] Like most other government scientists during the Progressive Era, Stiles was not doctrinaire on major political or social issues. For instance, he strongly supported the extension of governmental authority in 1896 to regulate country slaughterhouses which he had found to be filthy. He had also been willing, however, to apply his knowledge on behalf of American pork producers in 1898, when German restrictions on pork allegedly contaminated with trichinosis threatened their livelihoods.[49] As a government-employed professional, Stiles could warn his colleagues that "diseases have an economic as well as an academic side," and caution them:

> If it can be foreseen that a given working hypothesis is calculated to result in financial loss to an infected district, such hypothesis should be subjected to most searching criticism before it is published. And if it can be foreseen that any good to be accomplished by its announcement is far outweighed by its probable evil effects, its publication should be postponed until its correctness is demonstrated or is beyond reasonable doubt.[50]

In a period when the status and authority of experts were increasing, it was the opinion of Stiles's zoological colleagues that mattered to him, but when he found no evidence of tick transmission of Rocky Mountain spotted fever, he felt duty bound to correct the economic hardship produced by the "premature" conclusions about ticks and the disease published by Wilson and Chowning.

In popular accounts of the spotted fever story, Stiles's report is viewed as a setback to scientific progress.[51] By destroying or at least seriously challenging the assumption that spotted fever was a protozoan disease, however, it may have opened the way for a fresh approach. Response to Stiles's findings did indeed stimulate new inquiry, but to some extent this new work was a response to his somewhat uncharitable tone as well as to his facts. In November 1904, before his report was published, Stiles publicly discussed the shortcomings of his predecessors in spotted fever research when he delivered the Middleton Goldsmith Lecture to the New York Pathological Society. Taking as his subject, "Zoological Pitfalls for the Pathologist," he cautioned pathologists to be careful about drawing zoological conclusions if they were not thoroughly trained in zoology. He held up the piroplasma theory of Wilson and Chowning as a case in point, and his refutation of their theories "savored of scorn," as one writer noted.[52]

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[48] Cassedy, " 'Germ of laziness,' " p. 161.

[49] *Ibid.*; James H. Cassedy, "Applied microscopy and American pork diplomacy: Charles Wardell Stiles in Germany, 1898–1899," *Isis*, 1971, *62*: 5–20.

[50] Charles Wardell Stiles, "Zoological pitfalls for the pathologist," *Proc. N. Y. Pathol. Soc.*, 1905, p. 20.

[51] Price, *Fighting Spotted Fever*, p. 36; Philip A. Kalisch, "Rocky Mountain spotted fever: the sickness and the triumph," *Montana: The Magazine of Western History*, 1973, *23(2)*: 48.

Louis Wilson abandoned spotted fever research in 1905 when he accepted a position at the Mayo Clinic, but William Chowning smarted under Stiles's "adverse criticism" and hoped to vindicate his work.[53] In March 1906 he wrote to Howard Taylor Ricketts, a member of the faculty of the pathology department at the University of Chicago, inviting Ricketts to work jointly with him that summer.[54] Ricketts responded that he already had planned to take up the work, and that

> it was exactly this criticism of Stiles which gave me the idea of going to Montana to study spotted fever I was not at all pleased with the tone of his criticism as it was presented to the New York Pathological Society, and it occurred to me that this would be a good time for a third party to go into the field and repeat the ground covered .[55]

In the spring of 1906 Ricketts began his work on spotted fever. Chowning was in the field for a short time only, after which he returned to private practice in Minneapolis. Ricketts was joined in June by Walter W. King of the U.S. Public Health and Marine Hospital Service. Ricketts and King concentrated on finding an experimental animal model for the disease and then attempted to test the tick transmission theory by attaching ticks which had fed on infected animals to healthy ones. The guinea pig provided an excellent model because it developed easily identifiable symptoms, particularly the characteristic swelling of the scrotum in males. Ricketts and King both performed tick transmission experiments, and both got positive results, but King's report appeared eight days before Ricketts's.[56] Both King and Ricketts had been preceded in 1905 by a daring experiment on humans, the results of which were not published until 1908.[57] Idaho physician L. P. McCalla, with the assistance of his colleague H. A. Brereton, had obtained permission of two patients, one male and one female, to allow the doctors to attach to each of them a tick that had been affixed to a patient suffering from the mild Idaho form of spotted fever. Both patients became ill with spotted fever, and both recovered.

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[52] S Burt Wolbach, "Studies on Rocky Mountain spotted fever," *J Med Res*, 1919, *41* 9

[53] William M Chowning to Howard Taylor Ricketts, 15 March 1906, Howard Taylor Ricketts Papers, Department of Special Collections, Joseph Regenstein Library, University of Chicago, Chicago, Illinois, Box 8, Folder 9 Hereinafter cited as Ricketts Papers See also an evaluation of the scientific merit of Wilson and Chowning's research in Richard A. Ormsbee, " 'Studies in Pyroplasmosis hominis ("spotted fever" or "tick fever" of the Rocky Mountains)' by Louis B Wilson and William M Chowning," *Rev Infect Diseases*, 1979, *1* 559–62

[54] For biographical information on Ricketts, see sketches of him by Pierce C Mullen in *Dictionary of Scientific Biography*, ed Charles Coulston Gillispie (New York. Charles Scribner's Sons, 1970–80), 11 (1975) 442–43, H Gideon Wells in *Dictionary of American Biography*, supplement 1 (1944), ed Harris E Starr, pp 628–29, William K. Beatty and Virginia L. Beatty, "Howard Taylor Ricketts—imaginative investigator," *Proc Inst Med Chicago*, 1981, *34* 46–48, obituary in *JAMA*, 1910, *54* 1640

[55] Ricketts to Chowning, 17 March 1906, Ricketts Papers, Box 8, Folder 9

[56] Walter W King, "Experimental transmission of Rocky Mountain spotted fever by means of the tick. preliminary note," *Pub Health Rep*, 1906, *21* 863–64, Howard T Ricketts, "The transmission of Rocky Mountain spotted fever by the bite of the wood tick (*Dermacentor occidentalis*)," *JAMA*, 1906, *47* 358 This article was also published in Howard T Ricketts, *Contributions to Medical Science by Howard Taylor Ricketts, 1870–1910* (Chicago University of Chicago Press, 1911), pp 288–90 King's article appeared on 27 July and Ricketts's article, 4 August

It was Ricketts, however, who continued the work with spotted fever and ticks, bringing his colleagues and students at the University of Chicago Medical School and the associated McCormick Memorial Institute for Infectious Diseases into the work. They investigated the life cycle of the tick; established that the pathogenic organism, whatever it was, was transmitted biologically, not mechanically; and demonstrated that the organism was passed to succeeding generations of ticks transovarily.[58] In 1909 Ricketts found a tiny bacillus constantly associated with infected ticks and in the blood of victims of spotted fever[59] He described the organism as being "a bipolar staining bacillus of minute size, approximating that of the influenza bacillus [*sic*], although definite measurements have not yet been made."[60] Agglutination experiments with the bacillus in tick eggs produced no reaction with the blood of normal guinea pigs, but the blood of immune guinea pigs—those which had recovered from a bout with spotted fever—produced the "striking result" of complete agglutination "in dilutions up to 1 to 160."[61] However, because he could not culture the organism, and because, to his astonishment, he found similar, although avirulent, organisms in the eggs of non-infective ticks on the east side of the Bitterroot River, Ricketts declined to claim that the bacillus was the cause of spotted fever[62]

One reason he hesitated was that such a claim ran counter to the prevailing belief about arthropods and the transmission of disease, the postulate that Stiles had asserted in its most categorical form. Ricketts had studied zoology as an undergraduate at the University of Nebraska with the distinguished animal parasitologist Henry B Ward, so he was well aware of existing assumptions.[63] He had also studied bacteriology, pathology, and immunology at Chicago, in the research tradition of Christian Fenger and Ludwig Hektoen, and Ricketts identified himself professionally with these disciplines.[64] Ricketts's work on spotted fever suggested to him a bacterial cause, but he believed more conclusive experimentation to be necessary since no other bacterial disease had yet been definitely proven to be transmitted biologically by an insect or arthropod. He noted that:

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[57] L P McCalla, "Direct transmission from man to man of the Rocky Mountain spotted (tick) fever," *Medical Sentinel*, 1908, *16* 87–88

[58] Howard T Ricketts, "A summary of investigations of the nature and means of transmission of Rocky Mountain spotted fever," *Trans Chicago Pathol Soc*, 1907, *7* 73–82 (also in Ricketts, *Contributions to Medical Science*, pp 333–42), Maria B Mayer, "Transmission of spotted fever by the tick in nature," *J Infect Diseases*, 1911, *8* 327–29 (also in Ricketts, *Contributions to Medical Science*, pp 437–39), Mayer, "Transmission of spotted fever by other than Montana and Idaho ticks," *J Infect Diseases*, 1911, *8* 322–26 (also in Ricketts, *Contributions to Medical Science*, pp 440–44)

[59] It is interesting to speculate why Charles Wardell Stiles did not see in 1904 the organism Ricketts found in 1908 The most likely reason is that Stiles expected to be able to culture any bacteria that might be present, and when such experiments were unproductive, he looked only for larger, protozoan organisms There seems to have been no major improvement in microscopes during this period that would offer an alternative explanation See Robert Hagelstein, "The history of the microscope," *N Y Microscopical Soc Bull*, 1944, *2* 19, Savile Bradbury, *The Evolution of the Microscope* (Oxford Pergamon Press, 1967), p. 270.

[60] Howard T Ricketts, "A micro-organism which apparently has a specific relationship to Rocky Mountain spotted fever a preliminary report," *JAMA*, 1909, *52* 379

[61] *Ibid*, p 380

[62] Later experiments proved that the organisms were indeed avirulent *Rickettsia rickettsi*—the cause of spotted fever While manipulations of virulence have been performed in ticks in the laboratory, the reasons for the variation in virulence of the organism in nature have not been explained Some authorities double the final "i" in spelling the name of this organism Early writers used the single letter form

> A generalization frequently made in former years emphasized the hypothesis that all diseases which are transmitted habitually by insects are probably due to protozoan parasites, the assumption resting on facts which were known in relation to many insect borne diseases, as malaria, piroplasmosis, the malaria of the birds, and more recently, trypanosomiasis Plainly, however, the new developments regarding the relation of the flea to plague, and the tick to the relapsing fever of South Africa, both bacterial diseases, remove the ground for the generalization, and in facing a new disease of this type today, the possibility of a bacterial rather than a protozoan etiology demands unprejudiced consideration[65]

By 1909 Ricketts was not the only researcher challenging the earlier generalization, but none of them had been able to offer conclusive proof to overturn the theory. Investigations of bubonic plague by Great Britain's second Indian Plague Commission, for example, clearly implicated the flea as the vector of the disease but fell short of being able to demonstrate biological transmission.[66] In addition, disputes over the proper classification of particular species of microorganisms as protozoa or bacteria complicated the situation further. Tick-borne South African relapsing fever had been shown to be caused by a spirillium, as Ricketts noted, but the classification of spirillia as bacteria or protozoa was still being debated.

The continued vitality of the early theory was evident in a 1910 book, *Insects and Disease,* written by Rennie W. Doane, then an assistant professor of entomology at Leland Stanford Junior University. Doane supported conventional wisdom regarding both plague and relapsing fever, noting that the plague bacteria "find their way into the system principally through abrasions of the skin"—that is, mechanically.[67] He stated that Nuttall and others had recently corrected an earlier classification of the spirillium of relapsing fever as a bacterium. Instead, he wrote, it "should be classified with the simplest animals, the Protozoans."[68] Doane added, moreover, that certain "eminent zoologists" believed that when the germ of mosquito-borne yellow fever was identified, it would also be a spirochete.[69] He rounded out his discussion of insects and disease by projecting that although recent investigations had failed to confirm the finding of protozoan parasites in the blood of Rocky Mountain spotted fever victims, "it is now quite generally believed that the disease is caused by some such parasite and that the organism is transferred from one host to another by certain species of ticks."[70] Thus the association of protozoan organisms with biological transmission by an arthropod vector remained inviolate, at least among many researchers who worked in parasitological fields.

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[63] Edwin F Hirsch, "The insect vector as transmitter of disease," *Proc Inst Med Chicago,* 1969, *27* 294, see also four drawings labeled "From his zoology notebook" in Howard Taylor Ricketts, *Scrapbook,* prepared by his family and deposited in selected libraries The National Library of Medicine has a copy

[64] Hirsch, "Insect vector," p 294

[65] Howard T Ricketts, "Some Aspects of Rocky Mountain Spotted Fever as Shown by Recent Investigations," in Ricketts, *Contributions to Medical Science,* p 399

[66] "The plague in India reports issued by the advisory committee appointed by the Secretary of State for India, the Royal Society, and the Lister Institute of Preventive Medicine," *Lancet,* 27 July 1907, *2* 246–50

[67] Rennie W Doane, *Insects and Disease A Popular Account of the Way in Which Insects May Spread or Cause Some of Our Common Diseases* (New York Henry Holt, 1910), p 12

Further work by Ricketts on Rocky Mountain spotted fever had to be postponed after the 1908 season. Monies for the 1909 spotted fever work were not released by state authorities until too late for a full season's work. By the time the money became available, Ricketts had already accepted an offer to go to Mexico City to study typhus in the fall and winter of 1909/10.[71] There he described an organism constantly associated with typhus that was similar to the one he found in Rocky Mountain spotted fever, and he implicated the body louse as the vector of the disease.[72] Tragically, he also contracted typhus during his studies and died in May 1910.

Since the tick had been confirmed as the vector of spotted fever, the Montana state legislature directed its efforts after Ricketts's death toward control of the tick and destruction of its rodent hosts. A State Board of Entomology was created to carry on this program in conjunction with the U.S. Bureau of Entomology and the U.S. Public Health Service.[73] Domestic livestock were dipped and small rodents destroyed in a variety of ways. The dipping program was based on the successful model of Texas cattle tick fever control. The Texas cattle tick, however, had only one host, while the tick carrying Rocky Mountain spotted fever had three. The control program decreased the number of ticks in the Bitterroot Valley and the incidence of spotted fever cases, but it did not solve the problem as hoped.[74]

In 1916 S. Burt Wolbach, a professor of pathology and bacteriology at Harvard University, published a preliminary note in the *Journal of Medical Research* describing an organism he believed to be the cause of Rocky Mountain spotted fever. He hesitated to classify the organism because it could not be cultured, but he described its "bacillary form" and small size—from one-half to one micron in length and from 0.2 to 0.5 microns wide.[75] The Montana State Board of Health and State Board of Entomology invited Wolbach to continue his investigations on human cases, and in 1919 Wolbach published his findings in a report that occupied the entire November issue of the *Journal of Medical Research.*[76] His exhaustive studies revealed that the organism did not behave as expected for classification either as a bacterium or as a protozoan, and he concluded "that this parasite represents a new form of microorganism "[77] He named the organism *Dermacentroxenus rickettsi* (Wolbach) in honor of the martyred Ricketts, because, he said, "in the light of my own work it seems certain that Ricketts saw in the blood of infected animals and man the true parasite of Rocky Mountain spotted fever."[78]

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[68] *Ibid*, p 21

[69] *Ibid*

[70] *Ibid*, p 32

[71] Ricketts to H. Gideon Wells, 12 February 1910, Ricketts Papers, Box 8, Folder 13

[72] See collected articles on the etiology of typhus by Ricketts and Russell M Wilder in Ricketts, *Contributions to Medical Science*, pp 451–97

[73] Montana State Board of Entomology, *First Biennial Report, 1913–1914* (Helena, [1915]), p 5

[74] Price, *Fighting Spotted Fever*, pp 103–20

Wolbach's discovery of a new type of arthropod-borne microorganism helped to broaden scientists' conceptual approach to the more than 200 diseases that by 1920 had been linked to arthropod vectors.[79] His findings were buttressed by those of other workers, notably by Henrique da Rocha-Lima, who described a similar organism that caused typhus and was transmitted by the human body louse.[80] In addition to the discovery of rickettsial organisms, a growing body of evidence was being accumulated that yet another, non-cellular, type of pathogen, later labeled "virus," could be transmitted biologically by arthropods.[81] New information on bacterial diseases carried by arthropods was also published. In 1922 Edward Francis of the U.S. Public Health Service showed that the bacterium of tularemia could be transmitted by biting flies and other insects.[82] Other researchers finally laid to rest the controversy over the transmission of bubonic plague. In 1916 Arthur W Bacot and Charles J Martin demonstrated that plague was primarily transmitted by the bite of an infected flea rather than by the accidental contact between infected flea feces and skin abrasions on the human host[83]

In spite of these developments, the protozoan-arthropod connection remained a powerful model. The assumption that a spirochete was probably the cause of yellow fever persisted into the 1920s and lured even the acclaimed Rockefeller Institute researcher, Hideyo Noguchi, into a scientific fiasco that ultimately claimed his life.[84] Nonetheless, indications that a major change in the arthropod vector theory was imminent became apparent by the early 1920s. In a historical review of the work on insects and disease, L. O. Howard, chief of the U.S. Bureau of Entomology, wrote in 1921 that "all plausible guesses must be carefully considered" by researchers searching for unknown arthropod-borne pathogens[85] Howard's moderate position—in contrast to the dogmatic position of many earlier parasitologists—was doubtless conditioned by the results of research on the rickettsial diseases, especially Rocky Mountain spotted fever and typhus, and by the demonstration that fleas were obligatory biological vectors of bubonic plague.

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[75] S Burt Wolbach, "The etiology of Rocky Mountain spotted fever a preliminary report," *J Med Res*, 1916, *34* 121–25 For biographical information on Wolbach, see J McKeen Cattell and Jaques Cattell, eds, *American Men of Science*, 5th ed (New York Science Press, 1933), p 1228, obituaries by Charles A Janeway, *Trans Assoc Amer Physicians*, 1954, *67* 30–35, Shields Warren, *J Pathol Bact*, 1954, *68* 656–57

[76] Wolbach, "Studies on Rocky Mountain spotted fever," pp 1–197

[77] *Ibid*, p 87

[78] *Ibid*, p 38 Henrique da Rocha-Lima had already given the name *Rickettsia* as a genus to the typhus organism, when typhus and Rocky Mountain spotted fever were shown to be of the same genus, Da Rocha-Lima's precedence was recognized, and the Rocky Mountain spotted fever organism was renamed *Rickettsia rickettsi*

[79] Howard, "Fifty Year Sketch," p 434

[80] Henrique da Rocha-Lima, "Zur aetiologie des Fleckfiebers," *Deutsche med Wochenschr*, 1916, *42* 1353

[81] Hughes, *Virus A History*, pp 75–87

[82] Edward Francis, "Tularemia Francis 1921," U S Hygienic Laboratory *Bulletin* no 130 (1922)

[83] Arthur W Bacot and Charles J Martin, "Observations on the mechanism of the transmission of plague by fleas," *J Hygiene*, 1914, *13* (Plague Supp 3) 423–39, *idem*, "Further studies on the mechanism of the transmission of plague by fleas," *ibid*, 1915, *14* (Plague Supp 4) 774–76

Within another decade the transition to a recognition of the greater complexity of the arthropod vector theory was virtually complete. In 1931 an article in *Science* proposed a new threefold classification system to describe biological transmission of diseases by arthropods.[86] The early, traditional definitions constituted the first two categories in this new scheme. In "cyclo-propagative" transmission, pathogenic organisms undergo cyclical changes and multiply in the body of the arthropod. This is the case for the organisms of malaria and Texas cattle fever. In "cyclo-developmental" transmission, organisms such as the filariasis helminth undergo cyclical changes but do not multiply within the arthropod. A third category, called "propagative" transmission, in which pathogens multiply within the arthropod host but undergo no cyclical development, was added in this new system. Acceptance of this additional category as an equally valid type of biological transmission gave formal recognition to the evidence accumulated in thirty years of research on rickettsial, bacterial, and viral diseases.

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[84] Claude E Dolman, "Hideyo Noguchi (1876–1928) his final effort," *Clio Med*, 1977, *12* 131–45, Paul Franklin Clark, "Hideyo Noguchi, 1876–1928," *Bull Hist Med*, 1959, *33* 18–19

[85] Howard, "Fifty Year Sketch," p 434

[86] Clay Huff, "A proposed classification of disease transmission by arthropods," *Science*, 1931, *74* 456–57

THE PIG THAT FELL INTO THE PRIVY: UPTON SINCLAIR'S *THE JUNGLE* AND THE MEAT INSPECTION AMENDMENTS OF 1906*

James Harvey Young

The book was Upton Sinclair's *The Jungle,* and the nation was the United States.[1] The pig that went to market will in due course appear. Besides the pig, the four-and-a-half-month historical drama launched by *The Jungle,* and concluded with the enactment of a law better protecting the meat supply, involved a cast of millions. The American public in 1900 totaled nearly seventy-six million, and all but babies and vegetarians ate meat. Only Australia had a higher per capita consumption than America's 179 pounds a year, 186 pounds if lard was included.[2] Overseas, millions more ate meat imported from the United States.

With *The Jungle* Sinclair achieved a role of notoriety on the American stage. A persistent but unsuccessful novelist, who had recently converted to turn-of-the-century romantic socialism, Sinclair sought to follow his Civil War novel, *Manassas,* condemning chattel slavery with a contemporary novel castigating wage slavery.[3] Depressed by the lot of immigrant workers in Chicago's Packingtown, he lived with them for seven weeks in 1904, touring the meat-packing plants incognito.[4] Sinclair also talked with laborers, settle-

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*Revised version of a paper presented at the fifty-eighth annual meeting of the American Association for the History of Medicine, Durham, North Carolina, 16 May 1985.

[1] Upton Sinclair, *The Jungle* (New York: Doubleday, Page, 1906). The theme of this article has received considerable attention from scholars. An early example is Mark Sullivan, *Our Times,* 6 vols. (New York: Charles Scribner's Sons, 1926–35), 2: 471–83, 535–50; a recent account, Robert M. Crunden, *Ministers of Reform: The Progressives' Achievement in American Civilization, 1889–1920* (New York: Basic Books, 1982), pp. 163–99. The most thorough exploration is John Braeman, "The Square Deal in action: a case study in the growth of the 'National Police Power,'" in *Change and Continuity in Twentieth-Century America,* ed. John Braeman, Robert H. Bremner and Everett Walters ([Columbus, Ohio:] Ohio State University Press, 1964), pp. 35–80.

[2] A. D. Melvin, "The Federal meat-inspection service," in U.S. Department of Agriculture, Bureau of Animal Industry, *Twenty-Third Annual Report, 1906* (Washington, D.C.: Government Printing Office, 1908), p. 65.

[3] Sinclair gave his own account of the events prompted by *The Jungle* in several works, including *The Brass Check* (Pasadena, California: published by the author, [1919]), *American Outpost* (Pasadena, California: published by the author, 1932), and *The Autobiography of Upton Sinclair* (New York: Harcourt, Brace & World, 1962), and he discussed them with several interviewers at the Claremont Graduate School. Upton Sinclair, "Reminiscences About Some of his Novels and About his Political Career" (Typescript, Oral History Program, Claremont Graduate School, Claremont, California, 1963). The main biographical accounts are William Bloodworth, Jr., "The Early Years of Upton Sinclair: A Study in the Development of a Progressive Christian Socialist" (Ph.D. dissertation, University of Texas, 1972), and Leon Harris, *Upton Sinclair: American Rebel* (New York: Thomas Y. Crowell, 1975). The vast Upton Sinclair Archives at the Lilly Library of Indiana University contain very little prior to 1907, for in that year Sinclair's papers were burned in a fire that destroyed his cooperative living venture, Helicon Hall, financed by royalties from *The Jungle.*

[4] Sinclair, *American Outpost,* pp. 154–64.

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ment house workers, doctors, lawyers, real estate agents, policemen, and politicians. He gained confidence in his own apprehension of the packing plants' inexcusable uncleanliness by conferring with an authority on the world's abattoirs, the British physician Adolph Smith, with whom he shared a day of observation.[5] Then, returning to his rural New Jersey cabin, Sinclair wrote his novel at white heat, beset, as he said, with "tears and anguish." Serialized first in a socialist paper,[6] *The Jungle*, after five rejections, was published by Doubleday, Page in February 1906. Sinclair was twenty-seven. Pleased by the book's quick market success, the author, however, expressed dismay at the reason for it. The public seemed much less interested in his many pages about the degraded lot of labor than in his occasional references to the tainted condition of the nation's meat.[7] This response prompted Sinclair's famous remark: "I aimed at the public's heart, and by accident I hit it in the stomach."[8]

Sinclair sent a copy of *The Jungle* to President Theodore Roosevelt, his senior by just twenty years. Roosevelt, emboldened by his election in his own right, had begun to move more aggressively against what he deemed bad trusts.[9] The prices paid by packers to stockmen for cattle had been going down, while the prices paid by consumers for beef had risen. Collusion among Beef Trust companies received the blame. Investigative journalists rebuked the packers for their economic sins. The government won pyrrhic victories in antitrust suits against the oligopolists, who, during one trial, angered the President by trying to bribe reporters. Nor was Roosevelt indifferent to *The Jungle's* portrayal of Packingtown's unclean environment. The Rough Rider himself, in Cuba, had not been able to bring himself to eat "embalmed beef," and, in the investigation that followed the war, had testified against it. From generals down to privates, Roosevelt asserted, "I never …

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[5] Adolph Smith's series of articles, "Chicago, the stockyards and packing town," appeared in the *Lancet*, 1905, *1* 49–52, 120–23, 183–85, 258–60

[6] *The Jungle* appeared in *Appeal to Reason*, 25 February–4 November 1905 but was not completed Ronald Gottesman, *Upton Sinclair An Annotated Checklist* (Kent, Ohio Kent State University Press, 1973), p 30 The novel also appeared in *One Hoss Philosophy*, a quarterly journal published by the editor of the *Appeal* Considering *The Jungle* a key example of "popular naturalism," Christopher P Wilson, in *The Labor of Words Literary Professionalism in the Progressive Era* (Athens, Georgia University of Georgia Press, 1985), pp 113–40, presents a revisionary interpretation of the relation of this novel to Sinclair's earlier writing

[7] The unsavory passages in *The Jungle* include pp 9, 12, 28, 40–43, 49, 71–74, 90–117, 160–62 *The Jungle* sold 25,000 copies in the first six weeks, and in six months Sinclair had earned $30,000 in royalties Bloodworth, "Early Years of Upton Sinclair," p 190

[8] Sinclair, "What life means to me," *Cosmopolitan*, 1906, *41* 594. The way in which Doubleday, Page advertised *The Jungle*, stressing its tainted meat episodes, tended to condition the nature of public response Wilson, *Labor of Words*, pp 137–39

[9] John Morton Blum, *The Republican Roosevelt*, 2nd ed (Cambridge Harvard University Press, 1977), pp 72–74, Arthur M Johnson, "Theodore Roosevelt and the Bureau of Corporations," *Mississippi Valley Hist Rev*, 1959, *45* 571–90, Mary Yeager, *Competition and Regulation· The Development of Oligopoly in the Meat Packing Industry* (Greenwich, Connecticut JAI Press, 1981), pp 181–90, Elting E Morison, ed, *The Letters of Theodore Roosevelt*, 8 vols (Cambridge Harvard University Press, 1951–54), *5* 140–41 The most important journalistic critique of the beef trust was written by Charles Edward Russell for *Everybody's* and republished as a book, *The Greatest Trust in the World* (New York Ridgway-Thayer, 1905)

heard anybody speak of the canned roast beef when they did not take it as a matter of course that it was a bad ration."[10]

Others besides Sinclair sent *The Jungle* to the President, among them Senator Albert J. Beveridge from Indiana.[11] In transit from a conservative to a progressive stance, Beveridge sought an issue that would reveal his new posture and bring prominence to his name Even before reading Sinclair's book, the senator had pondered sponsoring a bill to extend to the domestic market the 1890, '91, and '95 meat inspection laws enacted to reassure Europeans that American meat was safe.[12] Now the senator asked the President if he might introduce such a law. Roosevelt agreed, and Beveridge set to work.

Considering charges made in a novel, especially a socialist novel, as unproven, Roosevelt ordered the Department of Agriculture to investigate. It found faults in the meat-packing industry but denied Sinclair's more sensational allegations.[13] Before these reports came in, the novelist, in a barrage of letters and telegrams to the President, beginning in early March, insisted that official judgments could not be relied on, because the Department of Agriculture was part of the problem, its own inspectors being careless and sometimes venal.[14] Roosevelt replied to Sinclair lecturing him on the shortcomings of socialism and the failings of naturalistic fiction. Then the President invited the novelist to the White House, impressed by his proposal that an independent undercover investigator be sent to Chicago. Sinclair promised to provide such an agent with leads. At his own expense, the novelist sent west a sister-socialist, Ella Reeve, destined in time to gain notoriety as the communist Mother Bloor.[15] She made contact with Sinclair's former informers, hoping to bring them together with Roosevelt's private emissary.

The President chose to send two men, both sociologists and social workers of reformist bent who had served him before in investigative roles. Charles P. Neill had once lived in the settlement house near Packingtown at which Sinclair ate his meals while in Chicago. Neill had recently left a professorship at Catholic University to become Commissioner of Labor. James B. Reynolds, who had a law degree, had served as secretary to the New York City mayor.[16] Neill's prominence made impossible the secrecy Sinclair thought indispensable. The Chicago press announced Neill and Reynolds' arrival. Agents for each packer met them at the front door and accompanied them on their rounds. Thus Sinclair's secret informers dared not talk with the commissioners for fear of exposure, and came to doubt the sincerity of Neill and Reynolds' mission. Ella Reeve, herself shadowed by packer detectives, transmitted to the commissioners the employees' shocking tales.

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[10] *Food Furnished by Subsistence Department to Troops in the Field,* 56th Cong, 1st sess, Sen Doc 270, Ser 3871, Part II, 1102 On this subject see Edward F Keuchel, "Chemicals and meat the embalmed beef scandal of the Spanish-American War," *Bull Hist Med*, 1974, *48* 249–64

[11] Braeman, "Square Deal in action," pp 54–57, and Braeman, *Albert J Beveridge American Nationalist* (Chicago University of Chicago Press, 1971), pp 101–10

[12] Melvin, "Federal meat-inspection service," pp 65–77, John L Gignilliat, "Pigs, politics, and protection. the European boycott of American pork, 1879–1891," *Agric Hist*, 1961, *35* 3–12 The terms of these laws were broad enough to offer some protection to the domestic marketplace—inspected but condemned meat was forbidden in interstate commerce—but appropriations had never been adequate to permit enforcement of such provisions by the Department of Agriculture

[13] Committee Report to Secretary of Agriculture, 3 April 1906, and Supplemental Report of Department Committee, 12 April 1906, in USDA, Bureau of Animal Industry, *Twenty-Third Annual Report,* pp 407–56

[14] Sinclair's early letters are referred to in Roosevelt's replies Roosevelt to Sinclair, 9, 15, and 21 March, 9, 11, and 13 April, 29 May, 2 June 1906, Sinclair to Roosevelt, 10 April (two letters and a telegram), 12 April, 29 May, 1 June 1906, Roosevelt to James Wilson, 12 March 1906, Theodore Roosevelt Papers, Library of Congress Some of these letters are included in Morison, ed., *Letters of Theodore Roosevelt,* volume 5

[15] Sinclair, *Brass Check,* p 40, Ella Reeve Bloor, *We Are Many* (New York International Press, 1940), pp 82–87 Ella Reeve was accompanied to Chicago by a younger comrade, Richard Bloor "After that," she stated in her autobiography, "in explaining the investigation to the public, Upton Sinclair thought it best to refer to us as Mr and Mrs Bloor, and the name has clung to me ever since [T]here was no romance connected with our association" (p 84)

Such stories, however, deemed unprovable by Neill and Reynolds, were not transmitted to the President. They decided to tell him only what they had seen during their two-and-a-half week investigation with their own eyes.[17] Even though the packers had been provided with weeks of time for a literal whitewashing, and despite the packers' constant shepherding, the conditions described by the commissioners to the President he summed up in the word "revolting." Roosevelt so feared the impact of the commissioners' observations on western stock growers and European meat importers that he withheld them from publication. Sinclair, conferring with Neill and Reynolds in Washington, acquired a sense of complete vindication.[18] Unlike the President, the novelist desired immediate release of the dismal discoveries.

Meanwhile Beveridge proceeded with successive drafts of a meat inspection bill, soon collaborating with the Secretary of Agriculture James Wilson and his subordinates who had begun to formulate a measure of their own.[19] On 21 May 1906 Beveridge introduced his bill into the Senate. Four days later he attached it to a pending Agricultural Appropriation Act, and on the next day it passed the Senate without a dissenting vote. Temporarily panicked by bad publicity and aware that the House offered better prospects for defeating or weakening the bill, the packers decided at the last moment not to oppose Beveridge's initiative in the upper chamber.

The publication of *The Jungle* launched an accelerating media extravaganza. The packers, through their extensive advertising, managed to obtain a friendly defense of their cause from numerous newspapers, and Ogden Armour, who headed one of Chicago's major packing houses, published ghost-written articles in the *Saturday Evening Post* denying all charges leveled by critics of the industry. Armour asserted: "... not one atom of any condemned animal carcass finds its way ... into any food product."[20]

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[16] Sinclair, *Brass Check*, pp 40–41, Braeman, "Square Deal in action," pp 48–52

[17] *Conditions in the Chicago Stock Yards Message from the President of the United States, Transmitting the Report of Mr James Bronson Reynolds and Commissioner Charles P Neill* , 59th Cong , 1st sess , House Doc 873, Ser 4990, (1906) p 3 The word "revolting" appears on p 1 of Roosevelt's message Braeman, "Square Deal in action," p 55

[18] Sinclair, *Brass Check*, p 41

[19] Braeman, "Square Deal in action," pp 54–59, *Cong Record*, 59th Cong , 1st sess , pp 7420–21

Key newspapers and major magazines, however, took the other side (Figure 1). Leadership in American thought, William James said, was departing the universities and entering the ten-cent magazines.[21] For several years some of these journals had displayed an intense reformist zeal, going so far as to arouse Roosevelt's ire. In the midst of the tainted meat furor, the President delivered his "muck-rakers" speech.[22] Not provoked primarily by the meat issue, Roosevelt may nonetheless have had Sinclair's strident critique in mind. Muckraking of the packers continued. Sinclair himself published several articles seeking to justify in fact charges he had presented in fiction.[23] Other writers joined the exposure campaign.

And the ten-cent magazines wielded the weapon of photojournalism. Sinclair's most shocking allegations could not be pictured, such as workers falling into vats and going into the marketplace as Durham's Pure Leaf Lard. But magazines presented the packers' vaunted disassembly line—disassembling a steer involved 157 men in seventy-eight different processes[24]—as an abhorrent spectacle set on a stage of filth.[25] Cattle were knocked on the head; hogs had their throats slit; blood ran deep in the killing beds. Carcasses were scalded, then cut up. Some meat became canned corned beef, some filled sausage skins.

No wonder that Finley Peter Dunne's irrepressible Mr. Dooley could remark: "... th' Prisidint, like th' rest iv us, has become a viggytaryan, an' th' diet has so changed his disposition that he is writin' a book called 'Supper in Silence,' didycated to Sinitor Aldrich."[26] The sale of meat, a packing house official admitted, had been cut in half.[27] Widespread editorial opinion, backed by aroused public sentiment, insisted on the enactment of a law.

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[20] Eight articles under Armour's name appeared in the *Saturday Evening Post* during the first half of 1906, volume 178, which were then collected in a book, *The Packers, the Private Car Lines, and the People* (Philadelphia: H. Altemus, 1906). The quotation is from Armour, "The packers and the people," *Sat. Eve. Post*, 10 March 1906, *178*: 8. Sinclair in *Brass Check*, pp. 34–35, charged that the articles had been ghost-written.

[21] James cited in Norman Hapgood, *The Changing Years* (New York: Farrar & Rinehart, 1930), p. 63.

[22] Theodore Roosevelt, "Muck-rakers," in Roosevelt, *The Roosevelt Policy*, ed. William Griffith (New York: Current Literature, 1919), pp. 367–78; "The man with the muck-rake," *Lit. Digest*, 1906, *32*: 605; Crunden, *Ministers of Reform*, p. 191. Roosevelt's principal target was believed to be David Graham Phillips, author of a series on "The Treason of the Senate" in *Cosmopolitan*.

[23] Sinclair, "Is Chicago's meat clean?" *Collier's*, 22 April 1905, *35*: 13–14; "The condemned meat industry," *Everybody's*, 1906, *14*: 608–16; "Stockyard secrets," *Collier's*, 24 March 1906, *36*: 24; "Is *The Jungle* true?" *Independent*, 1906, *60*: 1129–33; "The meat-inspection situation," *Collier's*, 16 June 1906, *37*: 24, 26. *World's Work* ran three telling articles by knowledgeable Chicagoans, 1906, *12*: 7491–514, and the *Literary Digest* paid close attention to the debate.

[24] Alfred D. Chandler, Jr., *The Visible Hand* (Cambridge: Belknap Press of Harvard University Press, 1977), p. 392.

[25] Such photographs appeared in *Current Lit.*, 1906, *41*: 4–10; and *Collier's*, 23 June 1906, *37*: 14. Another is reproduced in Martin L. Fausold, "James W. Wadsworth, Sr. and the Meat Inspection Act of 1906," *New York Hist.*, 1970, *51*: 53.

[26] Dunne, "Mr. Dooley on the food we eat," *Collier's*, 23 June 1906, *37*: 15–16.

[27] Thomas E. Wilson testimony, *Conditions in the Stock Yards*, Hearings before the Committee of Agriculture ... on the So-Called "Beveridge Amendment" to the Agricultural Appropriation Bill (H. R. 18537), 59th Cong., 1st sess. (Washington, D.C.: Government Printing Office, 1906), p. 75.

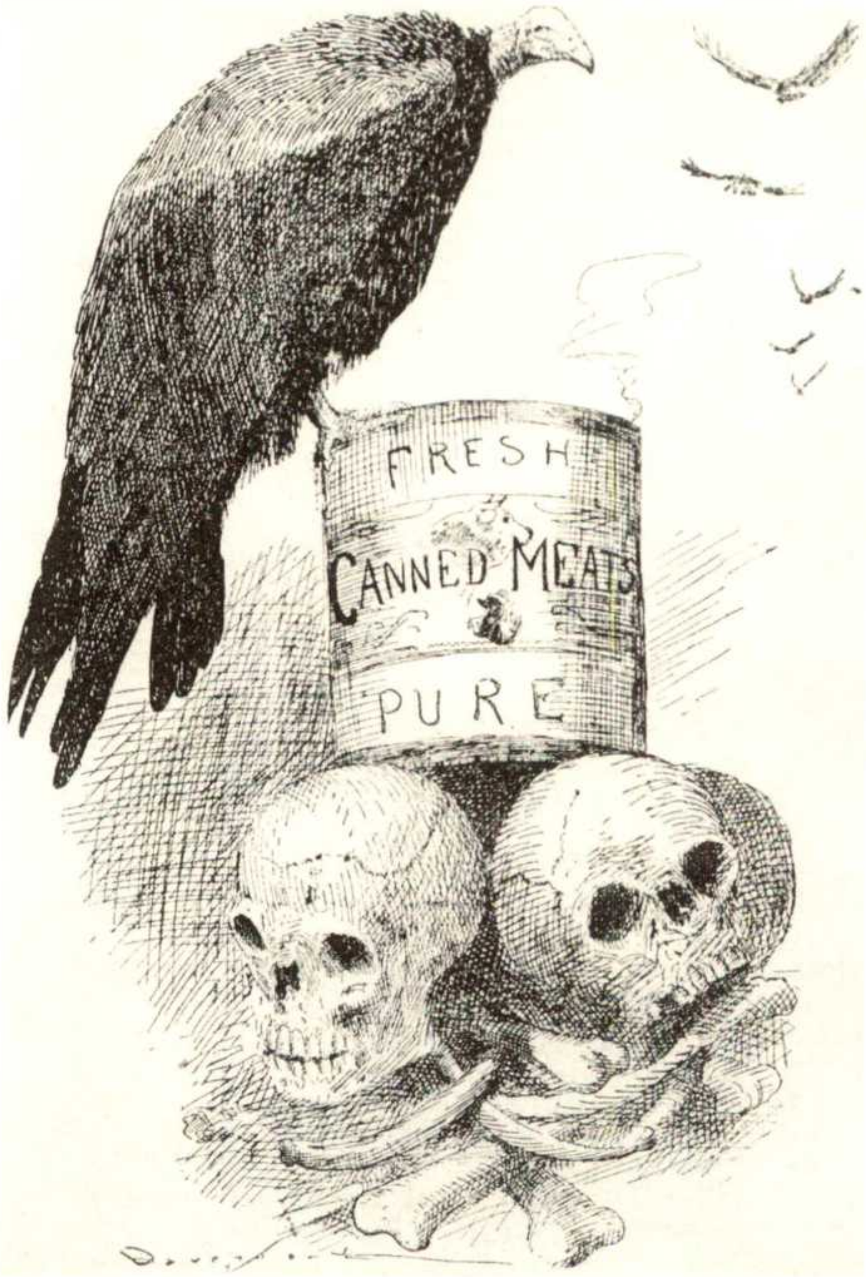

Fig. 1. Newspaper editorial cartoonists agitated the theme of tainted meat. This cartoon by Davenport, titled "None but the brave deserve the fare," appeared in the New York *Mail* and was reprinted in *Current Literature*, 1906, *41:* 8.

The President assumed a difficult double role, as muckraker, albeit a reluctant one (Figure 2), and as chief negotiator of a compromise that both Houses of the Congress would accept.[28] As muckraker, he kept leaking hints of the dire details in Neill and Reynolds' report. He hoped thereby to weaken meat packer opposition to an adequate law, while protecting their markets at home and abroad, and also safeguarding the interests of stock raisers from new losses which full disclosure would be sure to bring.

The packers were dead set against the Beveridge bill, which the Senate had accepted, and were joined in this opposition by big American business. The Indiana senator claimed for his bill "THE MOST PRONOUNCED EXTENSION OF FEDERAL POWER IN EVERY DIRECTION EVER ENACTED."[29] Against such an extreme thrust, business firmly set its heels. "What we are opposed to . . .," asserted a packer, is a bill that will "take the management and control away from the men who have devoted their lives to the upbuilding and perfecting of this great American industry," and will place "our business in the hands of theorists, chemists, [and] sociologists. . . ."[30]

If by now it seemed too late to stop legislation altogether, the packers looked to the House to remove the most objectionable provisions from the Beveridge bill.[31] Dating cans, they believed, would needlessly curtail sales. Dyes and preservatives enhanced rather than harmed meat and therefore should not be banned. Nor should packers be required to shoulder the cost of inspection. Worst of all, the secretary of agriculture could approve the shutting down of a plant by an inspector with no appeal to the courts permitted on substantive grounds. Such a provision, the packers charged, surely violated the Constitution.

The packers had strong allies in the House, especially James W. Wadsworth, chairman of the Committee on Agriculture, himself a raiser of cattle in upstate New York, and William Lorimer, "blond boss" of Chicago, also a committee member.[32] These two congressmen devised a bill meeting packer demands.

Upton Sinclair and Ella Bloor forced Roosevelt to revise his strategy. Sinclair thought an aroused and informed public more important than a new law, and he wanted the thorough vindication he expected from a full release of Neill and Reynolds' findings.[33] When the President refused Sinclair's urging of complete disclosure, the novelist related everything Neill and Reynolds had told him to the *New York Times*. He and Ella Bloor also gave the paper documents about events the two commissioners had not accepted as proven.

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[28] Braeman, "Square Deal in action," pp. 58–59.

[29] *Ibid.*, p. 57.

[30] Wilson testimony, *Conditions in the Stock Yards*, p. 5. Louis Filler stresses the centrality of a fight for power in the meat inspection issue, "Progress and Progressivism," *Amer. J. Econ. Sociol.*, 1961, *20*: 296–97.

[31] Braeman, "Square Deal in action," pp. 59–60.

[32] Fausold, "James W. Wadsworth, Sr.," pp. 42–61; Irving Dilliard, "Lorimer, William," *Dictionary of American Biography, Supplement One*, ed. Harris E. Starr (New York: Charles Scribner's Sons, 1944), pp. 511–12.

[33] Sinclair, *Brass Check*, pp. 41–43; *New York Times*, 28 and 29 May 1906.

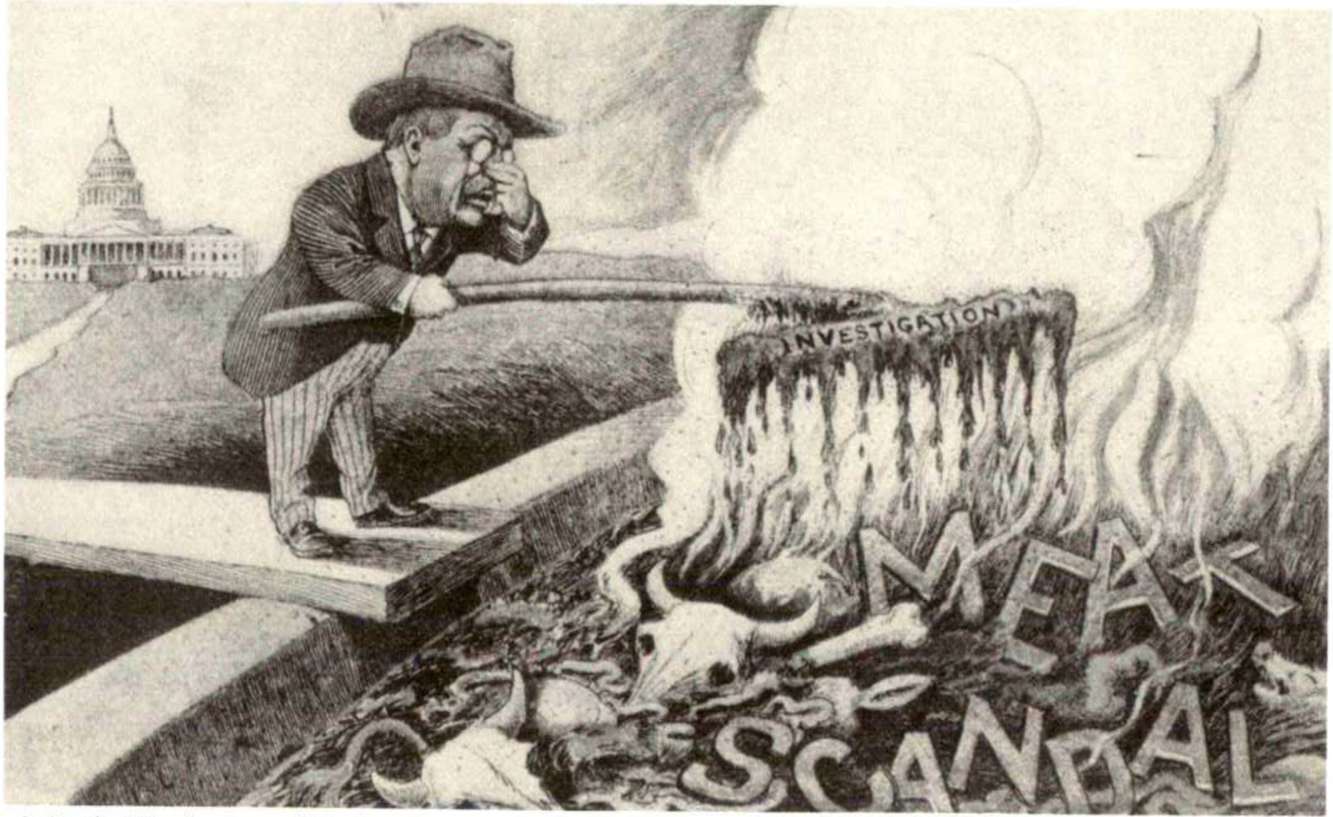

Fig. 2. President Theodore Roosevelt's leading role in investigating Packingtown's problems received much comment. This cartoon from the Utica *Saturday Globe*, titled "A nauseating job, but it must be done," was reprinted in *Review of Reviews*, 1906, *34*: 8.

Roosevelt wrote to Sinclair with remarkable restraint, refraining from any show of wrath because the impetuous novelist had let the cat out of the bag. But the President chided Sinclair for repeating to the *Times* "utterly reckless statements, which you have failed to back up with proof."[34] Roosevelt immediately had the two commissioners put their findings into writing, and he sent the report to Congress.[35]

Although the short document struck both Congress and public as somewhat *déjà vu,* its straightforward prose, describing what Reynolds and Neill had seen, even after the packers' frantic clean-up, had a sobering impact: "slimy and malodorous" pavements; universal uncleanliness—"dirt, splinters, floor filth, and the expectoration of tuberculous . . . workers."[36]

At last the pig appears. "As an extreme example," the commissioners stated, "of the entire disregard on the part of employees of any notion of cleanliness in handling dressed meat, we saw a hog that had just been killed, cleaned, washed, and started on its way to the cooling room fall from the sliding rail to a dirty wooden floor and slide part way into a filthy men's privy. It was picked up by two employees, placed upon a truck, carried into the cooling room and hung up with other carcasses, no effort being made to clean it."[37]

To challenge Neill and Reynolds at a hearing before the House Committee on Agriculture, the packers chose Thomas E. Wilson, the shrewd and articulate general manager of Nelson Morris & Company.[38] Most of the commissioners' criticisms, Wilson said, were "unjust and unwarranted." The "sight of blood and other offal" might well shock genteel theorists into exaggeration, whereas practical men would recognize the inevitability of gore. Nor could Neill and Reynolds' account of the pig that fell into the privy pass muster for accuracy. Displaying photographs, Wilson argued that, even if a hog had tumbled from the rail, no more than its feet could have gotten through the door into the toilet area.[39] In any case, Wilson insisted, privy room floors were kept clean.

Pro-packer Congressmen concurred in making the pig episode the supreme test of the commissioners' credibility:

"How much of the hog went into the urinal?" a Colorado representative asked Neill.[40]

"Not very much . . .," he replied. He held his hands nine inches to a foot apart. "[T]here might have been only that much."

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[34] Roosevelt to Sinclair, 29 May 1906, Roosevelt Papers.

[35] Roosevelt to Sinclair, 2 June 1906, Roosevelt Papers; *Conditions in the Stock Yards.*

[36] *Conditions in the Stock Yards,* pp. 3, 6.

[37] *Ibid.,* p. 7.

[38] *Ibid.,* pp. 5–94.

[39] The National Archives and Records Administration has no files of the House Committee on Agriculture for this session of Congress, in which these photographs might have been discovered.

[40] Congressman Franklin E. Brooks, *Conditions in the Stock Yards,* pp. 115–19. Fausold, "James W. Wadsworth, Sr.," pp. 51–53, comments on Wadsworth's strategy.

"Which end, the head or foot?"

"The head end."

"The nose of the hog stuck into that hole?"

"I don't remember whether the head was on the carcass or not."

Tempers flared as Neill was asked to give his recollection of the incident in full detail.[41] He did so, insisting that the episode revealed "an utter want of any conception of cleanliness on the part of the workers. . . ."

"You say no effort was made to clean it?" Chairman Wadsworth asked.

"None was made," replied Neill.

"Perhaps it was not the proper time to clean it."

"Yes, it had just passed the washing room, and instead of sending it back there they hung it up without doing anything about it. That was just exactly the impression it created upon me—"

"That was an impression?"

"And the room in which it was put had no water in it. . . ."

"Do you really think that hog went into [a] can without being cleaned?"

"I do, yes," asserted Neill.

But Wadsworth was not yet done. Shortly he brought the discussion back to "that poor hog," harrying Neill some more until an Alabama congressman objected: in contrast to the "proper respect" shown Wilson, Neill was being handled "as if he were being prosecuted." Neill himself protested. Yet Reynolds had a similar if somewhat less trying ordeal in the witness chair, again the "unwashed" pig holding center stage.[42]

Despite the badgering, the two investigators held their own, emerging with credibility intact. But they did not budge Wadsworth, Lorimer, and the committee majority from their opposition to Beveridge's bill.[43] Determined and complex efforts at compromise continued, with the President still at the center of the process. He recognized, as did Speaker Joseph G. Cannon, that the unity of the Republican Party was at stake. Failure to achieve enough harmony to resolve the issue so agitating the public portended unfortunate political repercussions. Roosevelt, aided by Representative Henry C. Adams, a former food and drug commissioner of Wisconsin, tried various tactics to wear down Wadsworth's intransigence, with minimal success. Finally, the President told Beveridge that he must yield on certain key points. The Senate, however, held fast to the bill it had earlier passed, after the House had passed the compromise bill. Conferees from the two Houses made no progress at resolution, so, as the session neared its end, the Senate, to get any law at all, yielded.

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[41] *Conditions in the Stock Yards,* pp. 120–28. The Alabama congressman was Sydney Johnston Bowie.

[42] *Ibid.,* pp. 144–46, 163. Sinclair asserted that Wadsworth refused his request to testify before the Committee. See *Brass Check,* p. 45.

[43] Fausold, "James W. Wadsworth, Sr.," pp. 47–61; Braeman, "Square Deal in action," pp. 66–78; *Cong. Record,* 59th Cong., 1st sess., pp. 8714, 8720–29, 8763–70, 8788–90, 9017–27, 9376–78, 9565–75, 9655–61, 9569–75, 9742, 9752, 9791–92; *Amendments to Agricultural Appropriation Bill,* 59th Cong., 1st sess., House Reports 4935 and Part 2, 4953, and 5072, Ser. 4908.

Roosevelt eased Beveridge's disappointment by sending him the pen with which he signed the measure, along with a note praising his initiative in the cause of more adequate meat inspection.[44]

The President sent no similar letter to Upton Sinclair, nor later, in discussing the law in his autobiography, did Roosevelt mention the novelist. A month after signing the law the President wrote to journalist William Allen White explaining his relationship with the socialist writer. Sometimes, Roosevelt said, one must ally oneself with others of differing and wrong reasons for backing a venture. "Thus in the beef packing business I found that Sinclair was of real use. I have an utter contempt for him. He is hysterical, unbalanced, and untruthful. . . . Nevertheless, in this particular crisis he was of service to us. . . ."[45]

Sinclair came away from the encounter disappointed and disillusioned. He had been less interested in a law that would seek to reform Packingtown than in persuading Roosevelt to develop genuine concern about the lot of stockyard workers. "[B]ut," Sinclair wrote in retrospect, "I tried in vain."[46] "I realized with bitterness," Sinclair commented in *The Brass Check,* "that I had been made into a 'celebrity,' not because the public cared anything about the sufferings of . . . [the] workers, but simply because the public did not want to eat tubercular beef." As time passed, Sinclair came to view the law with greater tolerance and his own role with enhanced pride. In his *Autobiography,* published in 1962, he wrote: "I helped to clean up the yards and improve the country's meat supply."[47]

In 1914 Sinclair had sought again to appeal to the public's heart, using a new and promising medium. *The Jungle* came out as a motion picture, Sinclair himself playing the role of socialist agitator.[48] What impact the movie had—much smaller than that of the novel—again hit its viewers in the stomach. Lurid posters promoting the cinematic *Jungle* illustrated such captions as " 'Doctoring' hams," "Quick Jurgis we must recover the body from the lard vat," (Figures 3 and 4) and "It's the meat that made her sick."[49]

What Beveridge lost from his measure was can dating and charging the packers for inspection costs; instead, the Treasury had to pay, to the tune of $3,000,000 a year. The President won his demand that inspectors be appointed under Civil Service rules, not by political patronage. Also he obtained

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[44] Roosevelt to Beveridge, 30 June 1906, Roosevelt Papers.

[45] Roosevelt to White, 31 July 1906, Roosevelt Papers; Theodore Roosevelt, *Theodore Roosevelt: An Autobiography* (New York: Charles Scribner's Sons, 1920), p. 443.

[46] Sinclair, *Brass Check,* p. 47.

[47] Sinclair, *Autobiography,* p. 126.

[48] "Socialist novel on the screen," *Kinematograph and Lantern Rev.*, 26 November 1914, and "Canned thrills! 'The Jungle,' " *Cinema,* 26 November 1914, clippings, Sinclair Archives, Lilly Library, Indiana University. Sinclair lost his copy of the movie acquired when the film company went bankrupt. Sinclair, *Autobiography,* p. 204; Harris, *Upton Sinclair,* pp. 150, 190. Earlier Sinclair, with a collaborator, had dramatized *The Jungle.* The play had a brief run in New York and other cities. Sinclair, *American Outpost,* p. 175; Bloodworth, "Early Years of Upton Sinclair," pp. 200–201.

[49] Posters in Sinclair Archives, Indiana University.

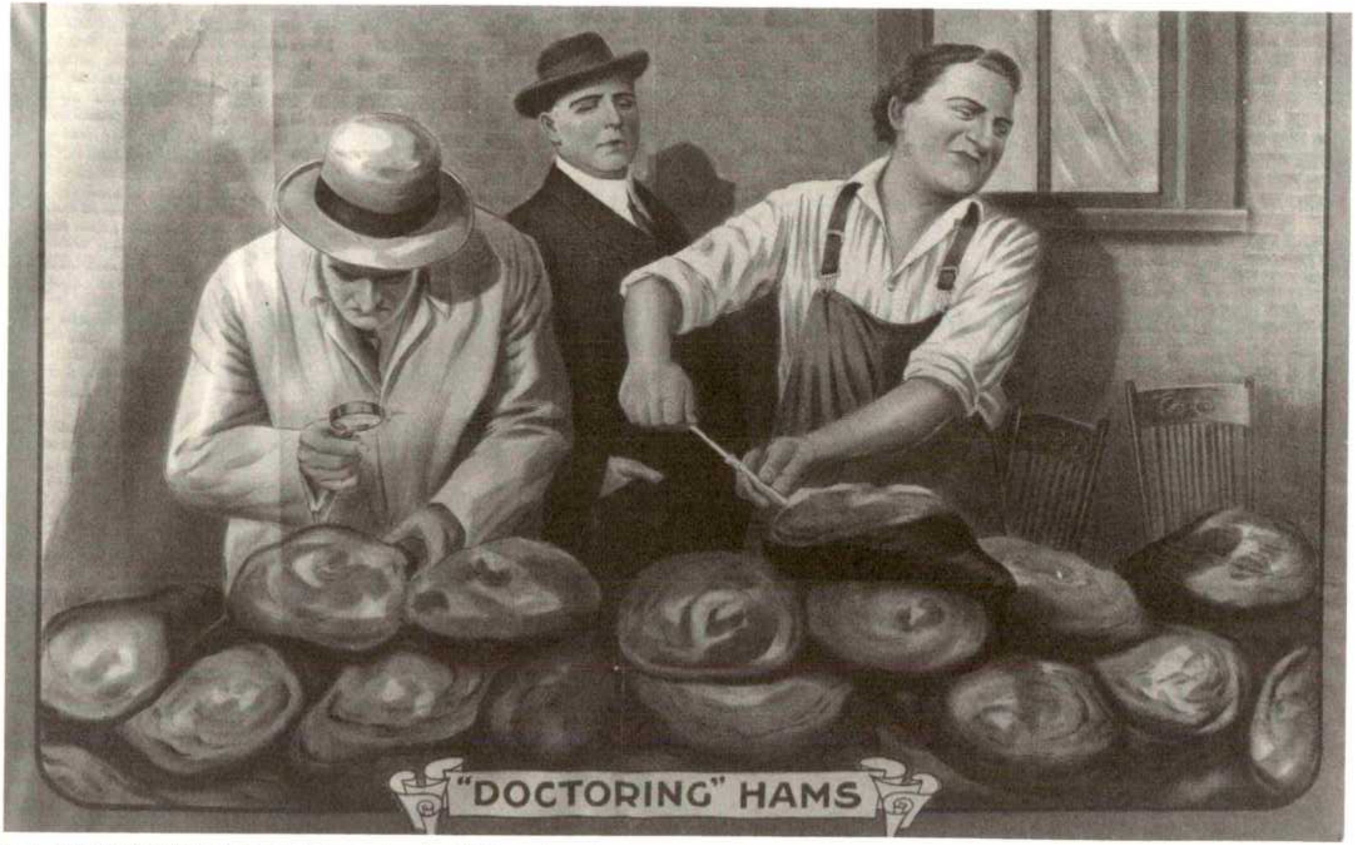

Fig. 3. "'Doctoring' hams," a poster promoting the 1914 motion picture version of Upton Sinclair's *The Jungle*, from the Upton Sinclair Archives, Lilly Library, Indiana University, used by permission of Lilly Library.

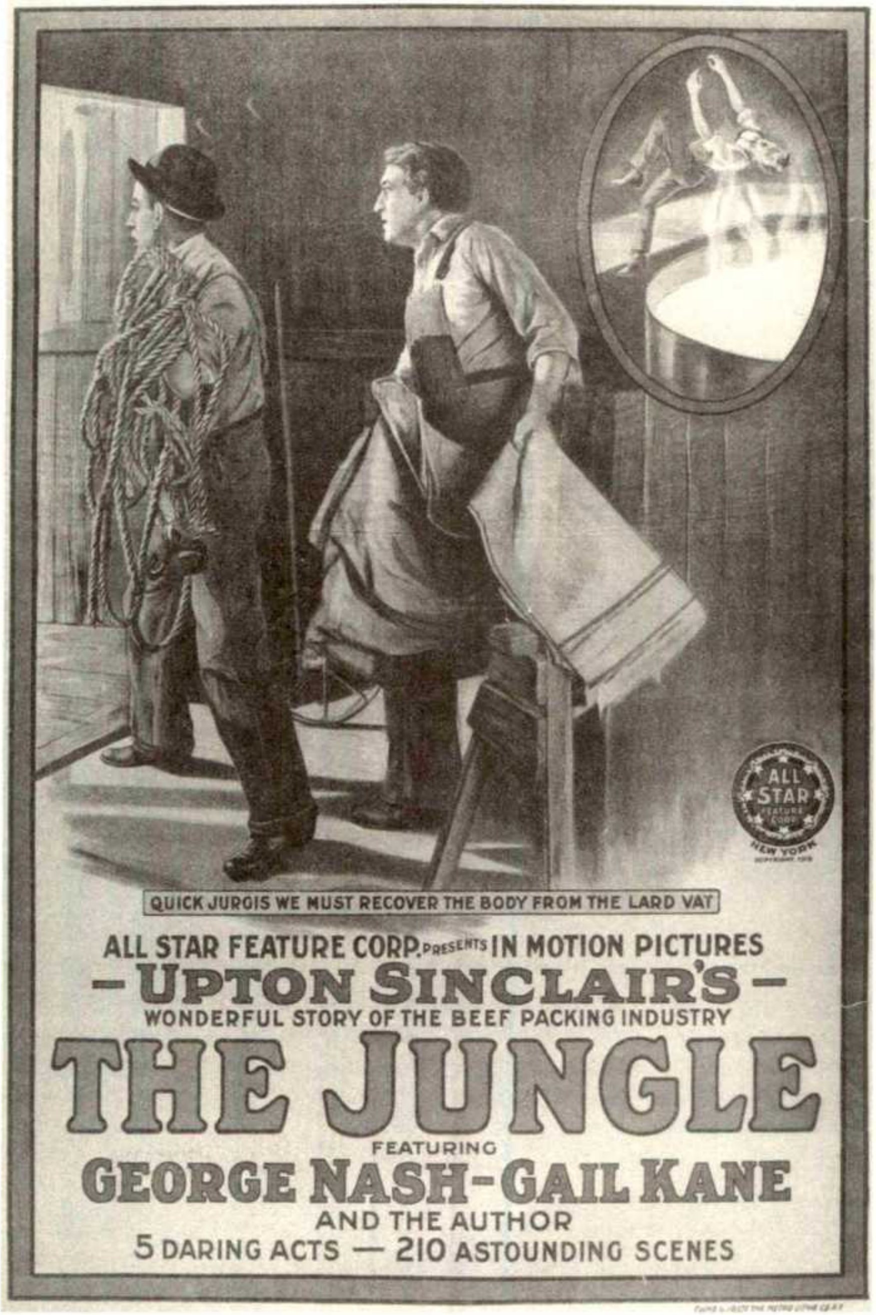
ALL STAR FEATURE CORP. NEW YORK
QUICK JURGIS WE MUST RECOVER THE BODY FROM THE LARD VAT
ALL STAR FEATURE CORP. PRESENTS IN MOTION PICTURES
- UPTON SINCLAIR'S -
WONDERFUL STORY OF THE BEEF PACKING INDUSTRY
THE JUNGLE
FEATURING
GEORGE NASH - GAIL KANE
AND THE AUTHOR
5 DARING ACTS — 210 ASTOUNDING SCENES

Fig. 4. "Quick Jurgis we must recover the body from the lard vat," a poster promoting the 1914 motion picture version of Sinclair's *The Jungle*, from the Upton Sinclair Archives, Lilly Library, Indiana University, used by permission of Lilly Library.

authority to withdraw inspection from any plant failing to comply with Department of Agriculture rules for destroying diseased carcasses. Court review provisions were compromised.[50] In all reforms, Beveridge said in the final debate, "everything at first proposed cannot be at first secured." "[T]he country could be congratulated," he insisted, "upon getting a good deal better bill than any informed man had a right to expect under all circumstances."[51] At least protection of meat in interstate commerce had begun, and consumer confidence in governmental inspection, causing people to return meat to their tables, benefited the packers too.

The turmoil over tainted meat, launched by *The Jungle,* advanced public health protection in another way: it proved an important factor in moving the Congress, after a quarter century of consideration, finally to enact, as the session drew to a close, a broad Food and Drugs Act.[52] On a broiling June day, President Roosevelt signed both measures into law.

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[50] U.S., *Statutes at Large,* 59th Cong., 1st sess., 1906, 34: 669–97, Ch. 3913. An Act Making Appropriations for the Department of Agriculture. . . . The meat inspection provisions are on pp. 674–79. "Result of the meat inspection dispute," *Lit. Digest,* 1906, *32:* 959–60.

[51] *Cong. Record,* 59th Cong., 1st sess., p. 9657.

[52] James Harvey Young, "The long struggle for the 1906 law," *FDA Consumer,* June 1981, *15:* 12–16. Harvey W. Wiley, the generalissimo of the forces seeking through a quarter of a century to secure the enactment of a food and drug law, shared the view that the exposure of conditions in Packingtown was "largely" responsible for arousing the public to demand also the broader food law. Oscar E. Anderson, Jr., *The Health of a Nation: Harvey W. Wiley and the Fight for Pure Food* (Chicago: University of Chicago Press, 1958), p. 195.

CORONERS' INQUISITIONS FROM THE COUNTY OF CHESHIRE, ENGLAND, 1817–39 AND 1877–78*

Thomas R. Forbes

Coroners' inquests were, and are, conducted in England in cases of sudden or violent death, deaths under suspicious circumstances, and deaths in prison. Duties of the coroner and his jury have for long included identification of the deceased, determination of when and where death occurred, elicitation of the medical causes of death, and establishment of the circumstances of death. The present effective system evolved only slowly from its beginning in 1194; in much of the nineteenth century many coroners discharged their duties imperfectly. From the medical standpoint the leading defect was the frequent failure to require a careful autopsy or even any autopsy at all. As a result, the medical evidence necessary for an informed coroner's verdict was quite often inaccurate or lacking.[1] In a road accident the cause of death was usually evident; when an unmarked body was found in a bedroom, the medical cause recorded by the coroner was often no more than conjecture. Thus in considering the following analysis of the official reports, or inquisitions, of the coroners' courts, the reader should allow not only for imperfections of medical diagnosis but for frequent absence of an adequate post-mortem examination.

Data for this survey were obtained from unpublished documents in the file *Coroners' Inquisitions* (*Assizes 66*), 1798–1891, at the Public Record Office, Chancery Lane, London. The inquisitions were either handwritten or were printed forms with blank spaces in which details had been inserted by hand. There are only a few scattered inquisitions before April 1817; the major period selected for study was from that date to the end of 1839. Gaps occur for eight months in 1818-19, four months in 1821, three months in 1822, and four months in 1826. For the sake of comparison, available inquisitions for 1877 and 1878 were also studied. The 4,821 inquisitions that were analyzed certainly fall short of the total number of inquests during this period but do supply a large and representative sample.

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* Transcripts of Crown-copyright records in the Public Record Office appear by permission of the Controller of H. M. Stationery Office.

[1] Thomas R. Forbes, *Crowner's Quest* (Philadelphia: American Philosophical Society, 1978), pp. 5–8, 42–47.

Bull. Hist. Med., 1985, 59: 481–494

The sex of the deceased could be determined from the given name but exact age was usually not specified except in 1877 and 1878. All individuals were counted as adults unless they were identified as children. The name of the town or village in which the inquest was held was also included in the record.

Cheshire, on the west coast of central England, has a considerable coast line due to the estuaries of the Rivers Dee and Mersey. On the north bank of the Mersey lies the great seaport of Liverpool, just across the county line in Lancashire. In the nineteenth century, ocean, coastal, and river shipping was supplemented by numerous small vessels using the extensive system of canals and locks. Railway lines spread rapidly during this period and, together with the canal boats, transported sandstone, marl, coal, and rock salt removed from the large deposits in Cheshire. Salt mining caused subsidence of the earth and the formation of pools and ponds. Manufacturing included textile weaving and salt refining. Transportation and manufacturing inevitably led to deaths in a variety of industrial accidents. These were the subject of coroners' inquests, as were fatal street and domestic accidents, together with drownings from ships and smaller vessels and from the shores of numerous rivers, canals, and ponds. Investigation of the circumstances of suicides and homicides of course was another obligation of the coroner and his jury. The particulars of many of the violent deaths, even as briefly described in the inquisitions, are interesting, partly because they tell a good deal about nineteenth-century life in Cheshire.

Male deaths from illness, summarized in Table 1, included those of a relatively small number of prisoners, mostly in the Castle of Chester at Great Boughton. Of the 1,074 deaths in 1817–39, only 70, or 6.5 percent, were identifiably those of children. The inquisitions reported that the latter had been found dead in bed, or had died at birth or of exposure or convulsions. Since it is well established that the infant and child mortality rate was still high in the nineteenth century, it appears that at least up to 1839 few deaths of children were judged to require an official investigation. On the other hand, in 1877–78, 26.5 percent of deaths ascribed to illness were those of children.

"Found dead" or "dead from natural causes" was the official explanation in well over half of all deaths from illness that came to inquest in 1817–39. The next most frequent verdicts of the coroners' juries were apoplexy, excessive consumption of alcohol, epilepsy, and fits. There is little mention of post-mortem examinations. Specificity of diagnosis had improved somewhat by 1877–78, although death from convulsions—a symptom rather than a disease—still was frequently alleged. About one quarter of the deaths were ascribed to heart disease. Lung and chest disease, probably consumption in most cases, was also a fairly common cause of death. The findings in female deaths from illness (Table 2) were not dissimilar to those for males.

It must be remembered that Tables 1 and 2 reflect not all deaths from

Table 1. Male Deaths Attributed to Illness in the County of Cheshire, 1817–39*

	1817–19	1820–24	1825–29	1830–34	1835–39	Total	1877–78
Natural death; no cause	6	14	21	163	290	494	23
Apoplexy	3	4	8	16	19	50	15
Alcoholism	1	1	4	13	15	34	4
Epilepsy, fit	1	2	6	11	12	32	3
Exhaustion, cold, hunger	—	1	4	5	10	20	5
Consumption	3	3	5	1	3	15	2
Typhus	1	—	2	3	4	10	—
Heart disease	—	2	1	—	6	9	51
Stomach, bowel disease	1	1	1	2	4	9	7
Prematurity, neonatal dis.	—	—	1	6	1	8	10
Ruptured blood vessel	1	—	3	1	3	8	4
Old age	—	—	—	3	4	7	—
Lung, chest disease	—	—	—	2	4	6	22
Convulsions	—	—	2	—	3	5	57
Fever	—	—	1	1	3	5	—
Asthma	1	—	—	3	—	4	—
Brain disease	—	—	1	2	1	4	1
Insanity	1	1	2	—	—	4	—
Dropsy	—	—	—	1	1	2	—
Liver disease	1	—	—	1	—	2	—
Cholera	—	1	—	—	—	1	—
Cow fever (vaccinia?)	—	—	—	1	—	1	—
Genito-urinary disease	—	—	1	—	—	1	—
Palsy	—	—	1	—	—	1	—
Scrofula	—	—	—	1	—	1	—
Smallpox	—	—	—	1	—	1	—
Measles	—	—	—	—	—	—	2
Sunstroke	—	—	—	—	—	—	2
Whooping cough	—	—	—	—	—	—	
Total deaths from all illnesses	20	30	64	237	383	734	210

* 1877–78 figures included for comparison.

Table 2. Female Deaths Attributed to Illness in the County of Cheshire, 1817–39*

	1817–19	1820–24	1825–29	1830–34	1835–39	Total	1877–78
Natural death; no cause	1	7	4	70	158	240	31
Epilepsy, fit	1	3	1	6	11	22	6
Apoplexy	—	1	2	8	7	18	7
Stomach, bowel disease	—	1	2	3	6	12	—
Convulsions	—	—	—	—	8	8	33
Prematurity, neonatal dis.	—	—	1	1	6	8	10
Genito-urinary disease	—	—	—	4	2	6	4
Alcoholism	—	—	1	2	1	4	4
Asthma	1	1	—	2	—	4	—
Consumption	—	—	1	1	2	4	1
Old age	—	—	—	2	1	3	3
Exhaustion, cold, hunger	—	1	—	—	1	2	3
Fever	—	—	1	—	1	2	—
Heart disease	—	—	—	—	2	2	45
Lung, chest disease	—	—	—	1	1	2	25
Liver disease	—	—	—	—	1	1	1
Ruptured blood vessel	—	—	1	—	—	1	5
Typhus	—	—	—	—	1	1	—
Measles	—	—	—	—	—	—	2
Whooping cough	—	—	—	—	—	—	2
Peritonitis	—	—	—	—	—	—	1
Scarlet fever	—	—	—	—	—	—	1
Surgical anesthesia	—	—	—	—	—	—	1
Total deaths from all illnesses	3	14	14	100	209	340	185

* 1877–78 figures included for comparison.

illness but rather those that were believed to require an inquest because they occurred suddenly or under unusual or suspicious circumstances. Thus consumption, actually one of the leading causes of death at that time, was reported infrequently. That "natural death" was so frequently invoked as an explanation reflected little more than the inadequacy of the coroner system, particularly during the first part of the nineteenth century.

Grim accounts of fatalities from cold and exposure did stir the sympathies of coroners' juries, at least to the extent of giving more circumstantial detail than usual. An inquisition told of a mother who, just released in February 1837 from the House of Correction after serving a sentence of fourteen days for assault, was carrying her baby home, "a distance of seventeen miles, the weather being cold and the said infant being tossed about in its mother's arms." The baby died. The jury noted that its body showed no signs of violence.[2] Just a year later a woman was found at one in the morning "more than knee deep in the Water of a Ditch" by the turnpike. She "having been afterwards brought in an open Cart to Upton by Chester [and] having been refused admission into different houses called at for that purpose," died "for want of timely relief and assistance from the Cold and Starvation."[3] Men too died of exposure and hunger, perhaps in greater numbers than women and children but with less apparent impact on the public conscience.

Summaries of the circumstances of death almost never mention witnesses at the inquest; expert testimony at best may sometimes be inferred from the inclusion of medical details in the findings of a jury. During the first half of the nineteenth century post-mortem examination extending beyond a cursory "view of the [exterior of the] body" seems to have been even less common in Cheshire than it was in London.[4]

In the case of the numerous accidental deaths (Tables 3, 4) juries usually entertained little doubt as to either the cause or circumstances of a death. Among the 2,324 fatal accidents to males, almost half of all the deaths in this study, drowning was the most frequent cause, a scarcely surprising finding when one thinks of the hundreds of vessels along the coast of the Irish Sea, on the Dee, Mersey, and other rivers, and on the extensive system of canals and of the people who lived and worked close to the water. Seamen fell from ships, lock tenders slipped into canals, and children perished even in small ponds. The bodies of the drowned were often washed up on beaches and shores. During severe gales on 5 and 6 December 1822, nine persons were drowned when the *Prince Regent,* a steam packet, ran aground; eight of the bodies came to inquest, as did those of the captain and nine others lost in the wreck of the *Sir John Welch* in August 1836.[5] Five persons perished

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[2] Weston, Feb. 1837 *Coroners' Inquisitions* (*Assizes* 66), 1798–1891, Public Record Office, Chancery Lane, London. All further references from this file will be cited simply by town and date.

[3] Upton by Chester, Feb. 1838.

[4] Forbes, *Crowner's Quest,* p. 44.

[5] "Domestic occurrences," *Gentleman's Mag.*, 1822, 92: 555

Table 3. Male Accidental Deaths in the County of Cheshire, 1817–39 and 1877–78

	Non-occupational	Occupational		Non-occupational	Occupational
Drowning			Other		
From vessel, pier	66	67	Falling object	7	23
In lock, canal	216	37	Crane, hoist	4	27
In river, pond	341	16	Ship's rigging, machinery	—	10
Other, unknown	214	9	Other machinery	10	60
	837	129	Collapse of building	5	7
			Cave in	12	32
Vehicles, Horses			Crushed	10	17
Moving vehicles	188	97	Mine accident	1	71
Horses	65	17	Quarry accident	1	18
	253	114	Railway accident	16	20
			Firearms, gunpowder	17	9
Burns			Lightning	5	—
Clothes ignited	211	—	Poison	12	1
Scalds	86	9	Choked, smothered	13	7
Salt factory	1	20	Overlaid	16	—
Other	4	4	Kick, blow	6	1
	302	33	Cut, stabbed	3	1
			Animal except horse	1	1
Falls			Other	13	5
Dwelling house	64	6		152	310
Warehouse	13	16			
Ladder, scaffold	5	7			
Street	13	2			
Bridge	8	—			
Other	42	18			
	145	49			

in January 1839 when their homes were suddenly inundated after the bursting of a dam that formed a factory reservoir. Tipsy males seeking their houses in the darkness repeatedly toppled into canals or from quays and piers. As elsewhere noted, intoxication and the absence of lighting were common causes of drowning and other accidents.[6]

At least 13 percent of all drownings were occupational.[7] Many of these victims were sailors or dock workers. Others were lock tenders who, straining from the bank of a canal to fend off a loaded barge or to push the long wooden bar that moved a massive lock gate, slipped and fell into the water.

Road and transportation accidents were also common. Drivers, sometimes asleep or intoxicated, fell from their perches on or just behind the shaft and were run over by their own carts or wagons. "Drunken driving" is not a new hazard. Pedestrians, many of them children, were knocked down

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[6] Forbes, *Crowner's Quest*, pp. 22, 26.

[7] In this survey when it was not clear whether a fatal accident had occurred during or as a result of employment, the death was counted as non-occupational.

Table 4. Female Accidental Deaths in the County of Cheshire, 1817–39 and 1877–78

	Non-occupational	Occupational		Non-occupational	Occupational
Drowning			Other		
From vessel, pier	18		Falling object	4	—
In lock, canal	39		Crane, hoist	1	—
In river, pond	86		Other machinery	5	9
Other, unknown	22		Collapse of building	2	—
	165		Cave in	2	—
			Crushed	2	1
Vehicles, Horses			Railway accident	7	—
Moving vehicles	48		Firearms, gunpowder	7	—
Horses	3		Poison	16	—
	51		Choked, smothered	10	—
			Overlaid	6	—
Burns			Animal except horse	4	—
Clothes ignited	301	—	Other	6	—
Scalds	50	—		72	10
Salt factory	1	1			
	352	1			
Falls					
Dwelling house	29	1			
Warehouse	2	—			
Street	8	—			
Other	12	2			
	51	3			

by horses or vehicles. Frightened teams ran away. Riders fell from their saddles. Stage coaches were upset.

Female deaths from drowning and from horses and vehicles (Table 4) were, as would be expected, far fewer than those of males. Customs and social constraints were such that girls and women were much less likely to pursue potentially dangerous activities, whether at work or not.

Deaths from burns and scalds were frequently reported in the inquisitions. Most occupational burns occurred in salt plants. The production of purified salt had been a Cheshire industry for centuries. Brine was evaporated in large heated metal pans into which workers might fall.[8] There is no mention of protective railings or other safety devices. But most burns and scalds occurred at home. Of the 275 non-industrial burn victims in 1817–39, 262, or 95.3 percent, were children aged 14 or less. Fifty-nine of these were under the age of five; in 127 more the victim was described simply as "young child." Twenty-two children were fatally burned in 1877–78. Many of the victims had been left unsupervised, alone or with other small children. Often they wore long cotton pinafores known as "brats" or "bishops." Clothing was ignited when the children came too close to, or

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[8] Frederick H. H. Crossley, *Cheshire* (London: Robert Hale, 1949), pp. 300–305.

Table 5. Burns and Drownings as a Percentage of All Accidents, London and Cheshire

	London			Cheshire	
	Burns	Drownings		Burns	Drownings
1788–94	8.0%	46.8%			
1795–1802	8.0	46.3			
1803–9	10.2	35.4			
1810–16	20.8	29.7			
1817–23	26.0	22.4	1817–19	15.7%	61.8%
			1820–24	20.5	49.2
1824–29	28.8	17.2	1825–29	18.0	47.9
			1830–34	24.3	38.3
			1835–39	25.7	34.0
			1877–78	13.2	22.2

fell into, a fireplace or played with matches or candles. Scalds resulted from upsetting containers of hot liquid or drinking from teakettles.

Table 5 indicates the proportions of all burns and scalds and of all drownings in relation to all accidents in the City of London and Southwark in 1788–1829[9] and in Cheshire in 1817–39 and 1877–78. It will be noted that in London during the first decades of the nineteenth century the percentage of burns increased remarkably but that the percentage of drownings conspicuously declined. In absolute numbers, during this period the population of London approximately doubled, while the numbers of burns increased more than seven-fold.[10] In Cheshire the proportion of all burns to all accidents, already high in 1817–19, swelled further in the next two decades. At the same time the proportion of drownings fell remarkably. Only 10 to 20 percent of all Cheshire drownings that came to inquest were those of children, rather small proportions in view of the hazards provided by the numerous rivers and canals and also by the pools and ponds that resulted from land subsidence.

Most of the burn victims were unsupervised young children—"alone with other small children locked in the Dwelling House," "left alone in the house of his parents," "being left with two other little children"—as the coroners' juries repeatedly noted. No doubt many fatal burns were truly accidental, but if one reads between the lines of the inquisitions and ponders the statistics, it is difficult to escape the terrible conclusion that some of the fatalities were the result of deliberate negligence. Such intent could not be proved; the charge was not set down in the inquisitions and the responsible adults escaped prosecution. Drownings, even if unobserved, nearly always occurred in public places; fatal burns, behind closed doors. Child abuse, then as now, was a private matter. As has been stated elsewhere, grinding poverty and the opportunity for financial gain if the child had been insured in one or more burial societies provided powerful temptation.[11] I plan to review the problem in more detail in another paper.

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[9] Forbes, *Crowner's Quest*, p. 24.

[10] John Hogg, *London as It is* (London: John Macrone, 1837), p. 196.

Data were not gathered to determine how long the high incidence of burns continued, but Table 5 shows a significant decline in their incidence in Cheshire by 1877–78. Certainly the nineteenth century's lamps and candles and open fireplaces were a considerable domestic danger, especially for little children and the aged.[12] By contrast, in 1973 in England and Wales all fatal burns from the ignition of clothing and from scalds constituted only 1.4 percent of all fatal accidents.[13]

Falls were another hazard. Most took place at home or at work, particularly on stairs. Darkness or intoxication or both were common contributing factors. Unprotected openings in the floors of factories and warehouses through which materials were raised or lowered from one story to another resembled unguarded elevator shafts and were equally dangerous.

Classification of the "other" fatal accidents (Tables 3, 4) presented some problems in terms of site of the accident versus its immediate cause. Site was favored when it seemed particularly significant, for example, in the case of a mine accident. Not surprisingly in view of the concurrent Industrial Revolution, the greatest single cause of fatal occupational accidents was machinery. Accounts in the inquisitions point to a lack both of safeguards and of respect for looms and other machines driven by water or steam power. For example, in Cheshire's textile industry there were repeated attempts to repair or replace a leather "strap" (belt) on a shaft while the latter was rapidly revolving. Such a shaft supplied power to several looms or spinning machines, all of which would have ceased production if the shaft's rotation were stopped. The entrance of women into industry was reflected in nine female deaths from machinery, all in the 1830s. Even a child, playing close to a whirring drive shaft, perished when her pinafore was caught. At least half a dozen other children were killed in manufactories; presumably they were employed there.[14] The clothing or limbs of adult victims were caught by a racing flywheel or the teeth of a "picker box" (cotton gin?) in cotton mills. Still others died when boilers burst or the wheels and pistons of steam engines moved unexpectedly. Hoisting accidents took place when the ropes or pulleys or legs of cranes broke.

Buildings collapsed. Earth caved in, sometimes when children were tunneling into sand banks but more often when marl was being dug from the ground. Thus a laborer preparing to load a huge mass into a railway wagon was standing "before the face of an intended fall of Clay which had been undermined" when it suddenly collapsed on him.[15] There were at least seven such accidents without any apparent change in procedure. The marl seems to have been used in brick-making.

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[11] Thomas R. Forbes, "Mortality at St. Bartholomew's Hospital, London, 1839–72," *J. Hist. Med.*, 1983, *38*: 432–49.

[12] See also Thomas R. Forbes, "Coroners' inquests in the county of Middlesex, England, 1819–42," *J. Hist. Med.*, 1977, *32*: 375–94.

[13] *The Registrar General's Statistical Review of England and Wales for 1973* (London: H. M. Stationery Office, 1976), Part I (B), Tables 17, 21, pp. 122, 124, 159.

[14] Samuel X. Radbill, " A History of Child Abuse and Infanticide," in Ruth S. Helfer and C. Henry Kempe, eds., *The Battered Child* (Chicago: University of Chicago Press, 1968), pp. 11–12.

In Cheshire salt production, most of the mineral was pumped from the ground as brine but rock salt was also mined. On one occasion failure to leave adequate supporting pillars in a salt mine resulted in the sudden collapse of its roof. Four employees standing not in the mine but on the surface above were fatally crushed when the earth fell in.

The coal mines were deeper, more numerous, and more dangerous. There were accidents with gunpowder (see below), and firedamp (methane gas and air) was responsible for suffocation and fatal explosions. In 1832, for example, death came to a worker in a mine "in which a Quantity of firy damp was generated, and having a lighted Candle with him."[16] Sir Humphry Davy had invented the safety lamp seventeen years earlier but evidently its use had not yet spread to Cheshire. On at least two occasions mine roofs collapsed with fatal results. Miners were killed when underground coal cars ran out of control on inclines. Various arrangements for hoisting coal or workers in tubs to the surface repeatedly failed with disastrous results. The growth of coal mining is reflected in the fact that, while there were no inquests into fatal mine accidents before 1830, there were twenty-four in 1830–34 and forty-two in 1835–39. Only two mine deaths came to inquest in 1877–78, due at least in part, it may be presumed, to the introduction of the safety lamp.

In quarries deaths were caused by premature explosions, falls of workers and falls of rock, and accidents in moving great stones.

The first public passenger-carrying railway in the world was opened in England in 1825. By 1835 a railway had come to Cheshire. In the ensuing five years four passengers or trespassers on the right of way and six employees were killed. The new transportation system spread; in 1877–78 alone thirty-three men and women, mostly employees, died in the construction and operation of railways.

Other inquests, predictably, were into deaths from gunpowder and firearms. A workman placed a blasting charge in a rock salt mine and laid a trail of gunpowder to ignite the charge. But "the Explosion . . . taking place sooner than he was enabled to get away from Danger," he was crushed by a block of salt.[17] Another salt mine worker lighted a primitive fuse made of a straw filled with gunpowder, then unwisely dropped it into an open keg of the explosive.[18] An employee of a powder mill was "liquoring [wetting] the

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[15] Higher Bebbington, Sept. 1838.

[16] Newton, June 1832.

[17] Witton, Feb. 1831.

[18] Northwich, Dec. 1837.

Ingredients for Gunpowder" so that it could be finely ground. While he was "straightening the liquid Gunpowder under the Wheel, that it might be regularly crushed, with a Copper Paddle or Shoval fixed in a wooden handle fastened by an *Iron Hoop,* upon which the [iron] Roller passed, a spark of fire emited therefrom." An explosion followed.[19] A rash individual had "a piece of gas pipe in his possession which was stopt at one end and a hole made therein in order to be charged with powder and fired off as a pistol and having charged the same with powder . . . he fired it off . . . the said pipe burst into pieces and one of the pieces struck him upon his head."[20] And, again predictably, there were inquests on the victims of "unloaded" or carelessly handled guns.

Five persons were killed by lightning. Two men who took shelter during a violent thunderstorm in the kitchen of a house should have been safe. But "the electric fluid entered the roof of the Cheese Room over the said Kitchen and passing down the Chimney" struck down both individuals.[21]

Accidental poisoning, mostly with arsenic or laudanum, was a constant hazard. Both substances were easily available, the former as a rodenticide and insecticide and the latter by over-the-counter purchase, often in the form of various soothing syrups for children. Arsenic preparations were taken by error from unlabeled containers. Carelessness or ignorance resulted in overdoses of laudanum. Other fatalities were caused by oxalic acid, potash, extract of lead (Goulard's solution, lead subacetate), and strychnine. One unfortunate "did take drink and swallow down a certain portion of deleterious Medicine intended by him to remove a certain Complaint with which he was affected." The guarded language of this inquisition suggests one of the quack remedies for venereal disease.[22] To a five-months-old baby afflicted with convulsions, its mother "to relieve its sufferings, had given it some warm gin and water, by reason whereof the Convulsions increased" and the infant died.[23]

In the opinion of William Farr, the great nineteenth-century biostatistician, many poison deaths went unrecognized as such, being ascribed instead to disease.[24] It may well be that not all Cheshire deaths from poisoning came to inquest.

At least twenty-two babies were reportedly overlaid while in bed with an adult. Some of these deaths possibly were not accidental; others may have represented the Sudden Infant Death Syndrome. Other forms of asphyxia claimed additional children and some adults. Toxic gases caused seven occupational deaths. One man died from fumes in a brewery beer vat, two

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[19] Thelwell, June 1835.

[20] Dukenfield, Sept. 1839.

[21] Beeston, May 1837.

[22] Hamford, Dec. 1831.

[23] Great Budworth, April 1837.

[24] William Farr, *Vital Statistics: A Memorial Volume of Selections from the Reports and Writings of William Farr*, ed. Noel A. Humphreys (London: Office of the Sanitary Institute, 1885), p. 294.

Table 6. Suicides by Sex and Method in the County of Cheshire, 1817–39

	Male	Female		Male	Female
Hanged	108	31	Not stated	2	—
Drowned	32	39	Choked	1	—
Cut throat	30	11	Defenestrated	1	1
Poisoned	21	16	Run over	1	—
Shot	6	1	All methods	202	99

from gases at the bottoms of wells they were digging, two from black damp (carbon dioxide) in mines, and two on wintry nights from carbon monoxide generated in the enclosed space of ships' forecastles by braziers of glowing charcoal.

The deaths of four young boys by hanging were counted as suicides but quite possibly may have been accidental, the result of autoerotic experimentation. All of the victims were said to be "under the Age of Discretion," i.e., less than fourteen years old. Two of the boys were nine and one was ten; the age of the fourth was not reported. All died in August, in 1818, 1829, 1835, and 1839 and in different towns.[25] One was found suspended from a hook; the other three, from trees. According to Adelson, individual victims who pursue sexual stimulation by partial self-strangulation are boys, not girls, aged nine to fourteen or fifteen.[26]

Suicides by sex and method are summarized in Table 6. It is well known that the statistics of suicide are likely to be under-reported. Some of the Cheshire drownings, for example, found by coroners' juries to have been accidental were probably suicides and a few may even have been homicides. In the absence of a witness, signs of a struggle, a suicide note or some other source of information, the circumstances of death were unclear.[27]

Coroners' juries usually specified that a victim of suicide had taken his life "while not being of sound mind and under-standing." Such a formula was in part an attempt to minimize the social stigma of the tragedy. Suicide while of sound mind was both a moral and a legal offense, *felo de se;* the property of a felon was forfeit to the Crown.[28] The compassionate attitude of coroners' juries in the face of these tragedies was disclosed in some inquisitions. One victim, it was stated, was "childish through the Infirmities of Age."[29] Another had jumped to his death "having been unfortunate in trade and . . . being under an Arrest for Debt and in a Steam Packet . . . crossing . . . the River Mersey on his way to be imprisoned for the said Debt . . . and having become suddenly delirious."[30]

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[25] Hargreave, Little Neston, Wigland, and Ness.

[26] Lester Adelson, *The Pathology of Homicide* (Springfield, Ill.: Charles C Thomas, 1974), pp. 552–53.

[27] In London the pockets of victims of drowning in the Thames were sometimes searched. If coins, a watch, or other valuables were found, it could be assumed that the dead person had not been assaulted and robbed and therefore that the death was an accident or suicide. See Forbes, *Crowner's Quest*, p. 23.

[28] Forbes, *Crowner's Quest*, p. 37.

[29] Nantwich, Jan. 1834.

[30] Eastham Ferry, July 1839.

But other inquests into suicides resulted in harsh verdicts. A man allegedly murdered his wife and then, "moved and seduced by the instigation of the Devil," cut his own throat.[31] The jury determined that another individual, discovered dead in a canal with a weight tied to his neck, "feloniously wilfully and of his Malice aforethought did kill and murder himself."[32]

There were only twenty inquisitions for homicides in the Cheshire files. London in 1788–1829 had 138 coroners' verdicts of homicide among 6,351 inquisitions, or 2.17 percent;[33] the corresponding figure for the Cheshire inquisitions was only 0.41 percent. This county may indeed have been more law-abiding than the metropolis. A more likely explanation is that additional inquisitions into alleged manslaughter and murder had been removed from the files and turned over to the criminal courts. There remained documents relating to fourteen homicides and one infanticide in males, and five homicides in females. All of the deaths appeared to be felonious except the shooting of a man robbing a corn mill who ignored the order of an armed guard; this was probably considered a justifiable homicide although that term does not appear. Most unusually, the written depositions of witnesses at another inquest, dated August 1835, had been preserved with the inquisition. The verdict of the coroner's jury was that the accused "did kill and slay," the phrase used in a case of manslaughter. One of the depositions had been made by a conscientious surgeon who testified not only that he had examined the body, observing that the neck "appeared to bear the marks of two fingers," but also that he had done an autopsy. He discovered "an Effusion of Blood in the Brain ... Saith on opening the Body he found it in perfect Health ... Injury must have been produced from External Violence, & that Violence must have taken place immediately before the Death thereby caused."[34] Significant expert testimony like this was unusual in an age when English forensic medicine was still relatively undeveloped.

Imhof has discussed some changes in the pattern of European mortality in recent centuries.[35] The predominant cause of mortality of course has been disease; as man has brought the latter partially under control, his life expectancy has been extended—some would say "improved," although Imhof questions this point of view. The reduction of mortality from disease in turn has depended primarily on advances in medical knowledge.

However, in the restricted but significant area of mortality from violence other than war, changes in incidence have been due chiefly to economic and social factors. A conspicuous example is seen in the effects of the Industrial Revolution. The construction and use of railroads brought new kinds of fatal accidents to railroad employees and passengers. Cheaper and more efficient transportation of freight by rail increased the demand for coal and consequently put more miners at risk. For a long time economic considerations inhibited the introduction of devices and practices that would have helped to protect employees from dangerous working conditions and machinery. Laws to enforce safety had not yet been passed. When a belt needed to be adjusted on a rapidly revolving shaft that supplied power for a row of looms, the shaft should have been stopped. But then production would have been stopped as well. So the workmen who fixed the belt took a chance and sometimes, as we have seen, lost the gamble. Coroners' inquisitions show that for centuries people moving about in the dark fell into excavations and off docks and down stairs. Torches and candles and gas lamps cost money.

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[31] Stockport, Aug. 1832.

[32] Runcorn, April 1833.

[33] Forbes, *Crowner's Quest*, p. 13.

[34] Altrincham, Aug. 1835.

[35] Arthur E. Imhof, "From the old mortality pattern to the new: implications of a radical change from the sixteenth to the twentieth century," *Bull. Hist. Med.*, 1985, 59: 1–29.

The human propensity for risk-taking was obviously another major factor in accidental and violent death. Sometimes a seemingly small risk was substituted for an inconvenience. Or an admittedly hazardous procedure was a well established tradition in a particular occupation or practice. For a laborer to undermine a great chunk of Cheshire marl to facilitate its removal must always have been clearly dangerous; each time an unlucky workman was crushed, his fellows had a reminder. But the technique continued. Until well into the nineteenth century all of London's coal and much of its building materials arrived in ships and barges on the Thames and were unloaded on men's backs. The laborers walked planks from one moored vessel to the next until the shore was reached. If a man slipped into the swift current he could easily drown, as did at least 154 such workers between 1788 and 1829. But the inquisitions into their deaths make no mention of safety measures.[36] One of the commonest forms of road accident occurred when a carter, tipsy or asleep, fell from his perch on the shaft and was run over by his own slowly moving vehicle, yet this remained the traditional seat for a carter. Imhof calls attention to the numerous old landscape paintings that include a bridge for which the railings are either missing or faulty and dangerous. In our own day we may only be dissuaded from taking some risks by the greater risk of censure, fine, or imprisonment. Here again, as in nineteenth-century Cheshire, social and economic factors help to shape the pattern of mortality from accident and violence.

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[36] Forbes, *Crowner's Quest,* p. 15.

ROMAN LAY ATTITUDES TOWARDS MEDICAL EXPERIMENTATION*

Gary B. Ferngren

The place of experimentation in Greek and Roman science has long been debated. We know that experiments were performed by Greek scientists. Yet it is doubtful that the Greeks and Romans ever devised anything like a truly inductive method. In part this was due to the continuing influence of philosophy on science, which strengthened the already existing tendency in Greek thought to overvalue deduction at the expense of induction. Scientists in classical antiquity often ignored empirical evidence when it did not fit a preconceived idea, and experiments that were performed were often conducted to support a particular theory. Hence they were in many cases merely corroborative and not truly inductive.[1] The role of experimentation in ancient science is related to the question of whether the ancients believed in the concept of progress, particularly in scientific endeavors. That the Greeks and Romans accepted the idea of progressive development of history and culture, indeed, that they had created it, was widely held in the nineteenth century. This view was rejected by J. B. Bury, who argued that the idea of progress is a modern one, and was not found in the classical world.[2] Ludwig Edelstein challenged Bury's view, which had almost acquired the status of dogma, by maintaining that there existed in the Greco-Roman world a belief in progressive development.[3] Other scholars, like E. R. Dodds, have been much more cautious in accepting Edelstein's view that the idea of progress was widely held in antiquity.[4]

This debate has considerable bearing on the question of the ancient

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[1] See Samuel Sambursky, *The Physical World of the Greeks* (New York: Macmillan, 1956), pp. 224–25; and Geoffrey E. R. Lloyd, *Early Greek Science: Thales to Aristotle* (New York: W. W. Norton, 1970), pp. 141–42.

[2] John B. Bury, *The Idea of Progress* (1920; rpt., New York: Dover Publications, 1955), pp. 7–20.

[3] Ludwig Edelstein, *The Idea of Progress in Classical Antiquity* (Baltimore: The Johns Hopkins Press, 1967).

[4] See Eric R. Dodds, "The Ancient Idea of Progress," in his *The Ancient Concept of Progress and Other Essays on Greek Literature and Belief* (Oxford: At the Clarendon Press, 1973), pp. 1–25. Edelstein's book has been termed "more erudite than convincing" and it has been suggested that "it will hardly make much dent on the general consensus which prevailed for the past fifty years. . . ." See Stanley L. Jaki, *Science and Creation: From Eternal Cycles to an Oscillating Universe* (New York: Science History Publications, 1974), p. 136, n. 110.

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physician's conception of duty to his art, particularly to the advancement of medicine and its ability to heal. How widespread among the medical profession was the belief that medicine had advanced and would continue to do so? Would the Greek or Roman physician have felt a moral or ethical imperative to engage in medical research or experimentation? The questions are complex and the answers given depend in part on the position of the respective physicians in the medical hierarchy and the time and place in which they practiced. The Alexandrian physicians Erasistratus and Herophilus undoubtedly present a different picture from a Greek slave practicing medicine at the behest of his Roman master. Edelstein was surely correct, however, in his statement that "one must not assume that the ancient physician experienced the restlessness of the modern scientist, who sees medicine as science in a perpetual process of change through one discovery after another."[5] The growing literature that addresses experimentation in classical antiquity has largely ignored lay (as distinct from professional) attitudes towards medical experimentation.[6] My purpose in this paper is to explore Roman lay attitudes to medical experimentation, especially as illustrating ethical considerations, in order to add, as it were, a footnote to the larger question of the role of medical experimentation and its relationship to the concept of progress in the ancient world. In doing so I shall focus primarily on a Roman rhetorical piece that is of particular interest for the subject.

No greater difference exists between modern and classical education than the place that rhetoric held in the curriculum of classical antiquity. The study of rhetoric formed a central part of a liberal education in Greece and Rome and was the means by which a young man acquired the art of speaking as an element of his preparation for a public career.[7] In Roman schools of rhetoric, practice exercises (*declamationes*) were prescribed for pupils as part of their training. Advanced declamations, called *controversiae,* were judicial orations in which some imaginary case in law was debated. Under the Roman Empire, as rhetoric became increasingly divorced from politics, the themes of declamations tended to become fantastic and unrelated to ordinary life, and they were designed merely to test the ingenuity and eloquence of orators in training.[8] A large number of these declamations have come down to us and they form a fascinating category of Roman literature. They are of interest to the social historian of medicine, for a number of them deal with themes that involve physicians, poisoning, or some aspect of forensic medicine. The appearance of physicians in declamations is indicative perhaps of the frequency with which they were the topic of conversation in Roman society, especially with regard to what we might loosely term "malpractice." Moreover, a prejudice against physicians, together with a fascination with them, was sufficiently widespread to be exploited in forensic literature. Latin rhetorical literature thus furnishes a rich but hitherto little explored source for the study of Roman lay attitudes regarding medicine.

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[5] Ludwig Edelstein, "The Hippocratic Physician," in his *Ancient Medicine,* ed. Owsei and C. Lilian Temkin (Baltimore: The Johns Hopkins Press, 1967), p. 90, n. 9.

[6] On medical experimentation see Geoffrey E. R. Lloyd, "Experiment in early Greek philosophy and medicine," *Proc. Cambridge Philo. Soc.,* 1964, n.s. *10:* 50–72, esp. p. 66 ff; *idem* "The role of medicine in the development of early Greek science," *Lampas,* 1975, *8:* 327–33; *idem, Magic, Reason and Experience* (Cambridge: Cambridge University Press, 1979), pp. 126–69, 222–25; and Heinrich von Staden, "Experiment and experience in Hellenistic medicine," *Bull. Inst. Class. Stud.,* 1975, *22:* 178–99.

[7] See Henri I. Marrou, *A History of Education in Antiquity,* trans. George Lamb (New York: New American Library, 1964), pp. 267–81.

[8] See Martin L. Clarke, *Rhetoric at Rome: A Historical Survey* (London: Cohen and West, 1953), pp. 85–99.

One of the most interesting pieces in the large and amorphous collection of Roman declamations is the Pseudo-Quintilian Declamation 8, which is one of nineteen *declamationes maiores* attributed to the well-known first-century rhetorician Quintilian.[9] Most scholars today doubt the attribution and believe that the piece probably dates from the second century A.D. or later.[10] The theme is typically far fetched. Two brothers who are twins become ill. The parents consult physicians, who say that they suffer from the same illness but offer no hope for them. Another physician, however, says that he can cure one of the twins if he can vivisect the other. The father grants permission and the physician cuts open the child and examines his organs. The child dies, while the other twin recovers, and the father is charged by his wife with murder. The declamation takes the form of a speech delivered by the prosecutor in court. It is probably the most detailed discussion that we have in ancient literature of vivisection, a subject that provoked considerable controversy in classical antiquity.[11] But although the theme of the piece is vivisection, the declamation contains an extensive discussion of a variety of issues that concern medical experimentation generally. Allowance must be made for the purpose of the declamation, its fantastic theme, and the dramatic requirements of the piece; nevertheless, it provides an excellent point of focus for an examination of Roman lay attitudes to medical experimentation and novel treatment. The subject is not treated as explicitly anywhere else in non-medical Roman literature.

In general one may say that an underlying polemic against physicians runs through the declamation. The physicians who were consulted initially refused to undertake treatment of the brothers whom they diagnosed as incurable. They are taken to task for their "arrogant conviction" that the case was hopeless (chap. 9). The refusal of the physicians to treat the twins is said to be preferable, however, to the claim of another physician to be able to cure one twin if he could vivisect the other (chap. 14). Even then, the speaker says, he does not trust the prognosis of a physician, whether it is one of despair or hope. In so many cases a sick patient has recovered without medical treatment. One must not put one's confidence in physicians (chap. 10). The father ought to have consulted the mother (who was left out of the deliberations), his relatives, and his friends, not merely in this matter but in every case of medical treatment (chaps. 4 and 11). The concern of the declamation with gathering the opinions of the patient's family and friends in such a serious case is not merely a dramatic motif. One finds it paralleled elsewhere in descriptions of Roman medical deliberations, especially when suicide is contemplated by those suffering from chronic illnesses.[12] Seneca records the case of Marcellinus, who summons his friends for advice on whether he should commit suicide in order to escape a disease that is not hopeless but will be long and painful.[13] His friends debate the matter, but Marcellinus does not ask for specific medical advice, and his decision is based on the advice of his friends. We may infer from this and similar passages, I think, that while the physician's advice was sought, it alone was not expected to determine whether one should pursue treatment.[14] That decision was based on a number of factors (some of them general and philosophical rather than medical) that were discussed by the patient's family and friends. Hence the prosecutor's criticism of the father for making the decision himself, based only on a physician's advice, was consonant with Roman lay opinion.

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[9] The text is edited by Georg Lehnert in *Quintiliani quae feruntur declamationes (maiores)* (Leipzig: Teubner, 1908), pp. 146–66. There is an English translation by John Warr, *The Declamations of Quintilian* (London: Oxford Theatre Edition, 1686), pp. 190–218. All translations of this declamation quoted in this article are my own.

[10] See John Wight Duff, *A Literary History of Rome in the Silver Age*, ed. Arnold M. Duff, 3rd ed. (London: Ernest Benn, 1964), pp. 331–32, for a brief discussion and bibliography.

[11] See Gary B. Ferngren, "A Roman declamation on vivisection," *Trans. Stud. Coll. Phys. Phila.*, 1982, series 5, *4*: 272–90.

The major criticism of the medical profession in the declamation is that certain physicians do experiments that endanger the lives of their patients. The charge is made specifically against the physician who proposed to vivisect one twin in order to save the life of his brother (chap. 15 and passim). However, it is apparent from the whole tenor of the speaker's remarks that if some form of medical experimentation other than vivisection had been employed, the same criticism would have been made, although the charge would have lacked the sensationalism that surrounded vivisection. Opposition is expressed to both therapeutic and scientific experimentation, although it is with the latter that the declamation is primarily concerned. One twin was to be vivisected in order to discover a cure for his brother. Yet the prosecutor says that to kill one child for the sake of his brother is indefensible; the fact that his brother was saved provides no justification. It added to the barbarity of the act that the child who was vivisected was sick, since "a greater regard (*reverentia*) attaches to mortals from illness" (chap. 8). That he was about to die made his sacrifice even more deplorable: "There is no son whom a father ought less to sacrifice for his own benefit alone than one especially who seems about to die" (chap. 11).

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[12] See Danielle Gourevitch, "Suicide among the sick in classical antiquity," *Bull. Hist. Med.*, 1969, *43*: 501–18, esp. pp. 514–15.

[13] Seneca, *Epistle* 77.5–9.

[14] Compare, however, Pliny the Younger, *Epistles* 1.22, where the physician's prognosis will determine whether Titius Aristo decides to commit suicide.

The prosecutor speaks forcefully against medical experimentation to advance knowledge. It is wrong to require the death of one man for the benefit of another who is sick, even if it is done to help the human race (chap. 16). It is not the purpose of medicine to kill but to heal. Experience is said to be sufficient for learning what needs to be known about disease; there is no need for daring experiments like this one. "What is he going to learn to help this sick person," asks the prosecutor, "which the experiences of so many generations and so many sick people have not learned?" (chap. 17). I have argued elsewhere that the declamation reveals the influence of the Empiricist sect in its polemic against experimentation and in its advocacy of experience over experiment.[15] But I believe that the opposition to experimentation goes beyond the influence of the Empiricists to reflect the general concern of the Roman lay public not only about medical experimentation, but about any novel treatment whose results are unknown. The prosecutor says that the mother of the twins would have been justified in complaining if by means of a novel and unknown method the physician had succeeded in saving both her sons, hence expressing opposition to therapeutic as well as scientific experimentation. It would have been better to agree with the physicians who offered no hope at all than to engage in a rash experiment (chap. 11). Refusing to administer a dangerous cure is preferable to risking the life even of a patient for whom there seems to be no hope (chap. 14).

The declamation does not suggest that laymen were categorically opposed to every kind of experimental treatment, provided that it involved the adaptation of proven methods rather than the use of wholly novel therapeutics. The prosecutor points out that the doctor had an excellent opportunity for experimentation since he could treat twins who suffered from the same disease. He suggests testing "the same things as well as harmonious, different, and contradictory things." He recommends positive treatment ("beneficial things") that is not "beyond the endurance of one man" (chap. 17). It is likely that he has in mind alternating dietetic treatment. His remarks reflect what seems to have been a widespread aversion amongst the ill to accepting risk in therapeutics and a desire for their "safety first." Their inability to understand treatment perhaps led them to prefer old, reliable, and tested remedies that were thought to involve little danger. This attitude influenced physicians as well, many of whom show some reluctance to experiment with untried procedures. Undoubtedly this reluctance stemmed in part from the concern expressed in the Hippocratic dictum that medicine should "help but not harm,"[16] and from the physician's inability to predict the outcome of novel treatment.[17] Galen acknowledged that rash experimentation could threaten the life of a patient. "But in the human body," he writes, "to try out what has not been tested is not without peril, in case a bad experiment leads to the destruction of the whole organism."[18] Physicians in antiquity, moreover, were careful to avoid treatment for which they might incur blame for the death of the patient.[19] Their reluctance to experiment was due in part to fear of slander, perhaps even of prosecution. Thus Lucian's *The Disowned* has as its theme a physician who has been disinherited by his father for refusal to administer to his stepmother the same treatment that cured his father's insanity. The physician says that he would not have undertaken the case lightly or prescribed a drug for her boldly, "fearing mischance and the slanderous tongues of the common sort."[20] Lucian earlier has him say that in treating his father "many of those present were suspicious of my prescription, critical of my treatment of the case, and ready to bring charges against me."[21] Perhaps we are meant to infer that the criticism he received in treating his father made him reluctant to risk similar treatment of his stepmother. He makes it clear that he believed that treatment of his stepmother would only result in failure, which would give him a bad name.[22] Hence he was concerned primarily with his reputation.

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[15] Ferngren, "Vivisection," pp. 280–82.

[16] See C. Sandulescu, "Primum non nocere: philological commentaries on a medical aphorism," *Acta Antiqua Hungarica*, 1965, *13*: 359–68. Sometimes only by abstaining from treatment (e.g., the use of drugs) could the physician avoid harming a patient. For examples of this "restraining attitude concerning curative means" see pp. 364–65.

[17] The difficulty of determining the effect of a new drug is described by Ctesias, a Greek physician who

The antipathy amongst laymen to medical experimentation that extended to novel or previously untried treatment is found elsewhere in non-medical writings, perhaps most prominently in Pliny the Elder (first century after Christ). Pliny, writing of physicians, charged that "there is no doubt that all these, in their hunt for popularity by means of some novelty, did not hesitate to buy it with our lives."[23] His statement reveals a deep-seated distrust of physicians based on the recognition that they had, in Pliny's words, "control

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served in the Persian Court (late fifth and early fourth century B.C.): "In the generations of my father and my grandfather no physician prescribed hellebore, for they did not know how to mix a potion of it or the measure and amount in which to give it; and, if a physician ever dared to prescribe a potion of hellebore, he first asked the patient to make his will, since he was facing great danger, and of those who took the potion many were choked to death and only few survived. Now, however, hellebore seems to be a perfectly safe remedy" (Ctesias as quoted by Oribasius, *Collectionum Medicarum Reliquiae*, 8.8, vol. 1, ed. Ioannes Raeder [Leipzig and Berlin: Teubner, 1928], p. 261; translated by Edelstein, *Idea of Progress*, p. 75). See, however, Pliny's warnings regarding the drug (*Natural History* 25.23–25).

[18] Galen, *In Hippocratis Aphorismos Commentarii* 1 in *Claudii Galeni Opera Omnia* ed. Carl Gottlob Kühn, 20 vols. (Leipzig: Cnobloch, 1821–33), 7B: 353–54. Translated by Owsei Temkin, in "The Idea of Respect for Life in the History of Medicine," in Owsei Temkin, William K. Frankena, and Sanford H. Kadish, *Respect for Life in Medicine, Philosophy, and the Law* (Baltimore and London: The Johns Hopkins University Press, 1976), p. 4. According to Thorndike, "Galen more than once tells us of abstaining from testing some remedy because he had others of whose effects he was surer" (Lynn Thorndike, *A History of Magic and Experimental Science*, 8 vols. [New York and London: Columbia University Press, 1923–58], 1: 161).

[19] Their concern was primarily to preserve their reputation and perhaps only secondarily to avoid prolonging a life that had become unbearable. "For it is the part of a prudent man," writes Celsus, "first not to touch a case he cannot save, and not to risk the appearance of having killed one whose lot is but to die" (*De Medicina* 5.26.1 C, trans. William G. Spencer, 3 vols., Loeb Classical Library [Cambridge, Mass.: Harvard University Press, 1935–38], 2: 67). The Latin text at this point is corrupt.

[20] Lucian, *Disowned* 31, trans. A. M. Harmon, 8 vols., Loeb Classical Library (Cambridge, Mass.: Harvard University Press, 1921–67), 5: 523.

[21] *Ibid.*, 4, Loeb translation 5: 483.

[22] *Disowned* 32.

[23] Pliny, *Natural History*, 29.5.11, trans. William H. S. Jones, 10 vols., Loeb Classical Library (Cambridge, Mass.: Harvard University Press, 1942–63), 8: 189.

over our life and destruction" (*imperatorem vitae nostrae necisque*). Although the theme of the helplessness of the patient vis-à-vis the physician is a commonplace in many societies, it is particularly in Roman society that fears were expressed about the matter. This apprehension is grounded in the realization that physicians possessed knowledge which they could and sometimes did use to harm rather than to heal. Hence there existed in Roman society a pervasive ambivalence between the desire for efficacy in medical treatment and the fear of becoming a victim of an unscrupulous physician. The conception of the physician as an unpunished killer is a popular motif in Roman literature.[24] There may well be an element of racial prejudice, against Greeks in particular, that underlies this motif, as there certainly was in the charge by Cato the Elder (234–149 B.C.) that Greek physicians murder all foreigners (*barbaros omnes*) by means of medicine.[25] Physicians were frequently imagined to have been implicated in the deaths of those who were poisoned. It seemed a natural inference from their use of drug therapy that their special knowledge was responsible for poisonings whenever they occurred. This "hysterical poisoning-phobia," as Kudlien calls it, developed into a strong prejudice with which physicians had to contend throughout antiquity.[26] Hence it is not surprising that some physicians reacted to this suspicion by refusing to adopt drug therapy as a means of avoiding public distrust.[27] One can understand why the lay public, familiar with charges of poisoning brought against the medical profession, might view with suspicion experimental drugs or procedures. They feared the possibility of serious harm from physicians who were, as a profession, believed by many to experiment at the expense of their patients. Many physicians (like the one described by Lucian) would naturally have tended to be cautious in employing novel treatment.

The declamation skillfully exploits another popular medical prejudice in classical antiquity: fear of the knife (see chaps. 16–18). "For the modern," writes Edelstein, "it may be difficult to imagine a medical art without surgery in the strict sense of the word. . . . Yet in antiquity popular opposition to 'cutting and cauterization' was strong indeed. . . The attitude of the ancients never changed in this respect."[28] Roman sensitiveness to pain induced by the knife dates at least from the introduction of Greek medicine into Rome. Pliny writes that the earliest physician to come to Rome (in 219 B.C.), a Greek named Archagathus, was called the Executioner (*carnifex*), "from his savage use of the knife and cautery . . . and his profession, with all physicians became objects of loathing."[29] According to Scribonius Largus (ca A.D. 1–50), "the ancients cured illnesses of the body by herbs and roots because the timid race of mortals at the beginning would not easily commit themselves to the knife and fire. Even now many do this, though I do not say everyone, and unless compelled by dire necessity and hope of this solution, do not allow it to be done to them, which doubtless must be endured with difficulty."[30] The fear which surgery engendered in the classical world in the absence of effective anesthetics is graphically portrayed by Augustine in his description, in Book 22 of *The City of God,* of the miraculous healing of Innocent, a Roman ex-advocate and devout Christian, residing at Carthage, who was undergoing medical treatment for a complicated case of multiple rectal fistulae.[31] The initial operation caused excruciating pain that persisted for many days and Innocent was informed that a second operation was required. Augustine vividly describes Innocent's fear of the scalpel and his anguish at the prospect of a second operation. Given the widespread fear of the knife, it is not surprising that vivisection was regarded with such horror in the classical world.[32] A strong antipathy both to dissection and to anatomists also underlay this horror. Augustine's attitude is typical: "with a cruel zeal for science, some medical men, who are called anatomists, have dissected the bodies of the dead, and sometimes even of sick persons who died under their knives, and have inhumanly pried into the secrets of the human body to learn the nature of the disease and its exact seat, and how it might be cured."[33] The declamation contains a sensational and gruesome description of the physician's vivisection of the twin (chaps. 19–21), a description that appeals for its effect to the popular revulsion of the knife and of dissection. Undoubtedly, too, the filicide of the father and his failure to protect his son added to the repugnance of this act.

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[24] On the theme of the physician as an unpunished killer, see Fridolf Kudlien, "Medical ethics and popular ethics in Greece and Rome," *Clio Medica*, 1970, 5: 91–121, especially pp. 97–107. I am indebted to Kudlien's discussion of several points.

[25] Quoted in Pliny, *Natural History* 29.7.14. See Kudlien, "Medical ethics," pp. 98–99; and Joanne H. Phillips, "The emergence of the Greek medical profession in the Roman Republic," *Trans. Stud. Coll. Phys. Phila.*, 1980, series 5, *2*: 267–75.

[26] Kudlien, "Medical ethics," p. 102. On poisoning generally, see David B. Kaufman, "Poisons and poisoning among the Romans," *Classical Philology*, 1932, *27*: 156–67.

[27] See the complaint of Scribonius Largus, *Professio medici* 23–70, in *Professio medici: Zum Vorwort des Scribonius Largus*, ed. Karl Deichgräber, no. 9 (Wiesbaden: Franz Steiner für die Akademie der Wissenschaften und der Literatur, Mainz, 1950), pp. 24–25.

[28] Edelstein, "The Hippocratic Oath," in *Ancient Medicine*, p. 31, n. 96.

The declamation makes much of the inquisitiveness of the physician in performing the vivisection. "Now do you think," asks the prosecutor, "that the physician investigated only the causes of this sickness? He investigated whatever he did not know and, having used this most extraordinary opportunity, he wished to advance to every novelty" (chap. 21). The curiosity of physicians was proverbial in antiquity. Far from being a quality that was admired in physicians, it was regarded unfavorably. Patients neither expected nor desired their physicians to be scientists. Their duty was to heal, not to discover new knowledge. A patient in the classical world is likely to have felt victimized by a physician who sought to use his case for the advancement of medical knowledge. He did not wish to suffer risk even if the result might benefit the health of others; hence the repeated opposition in the declamation to the twin's being used to find "a cure for the human race" (chap. 16). Thus we can speak with Temkin of a "clash" between "the physician's respect for life and the scientist's respect for human life in general" that existed in the classical world.[34]

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[29] Pliny, *Natural History* 29.6. 12–13, Loeb translation 8: 191.

[30] Scribonius Largus, *Professio medici* 18–23.

[31] Augustine, *City of God* 22.8, trans. Marcus Dods (New York: Modern Library, 1950). Innocent's healing is described together with several miracles of healing said by Augustine to have occurred in his own day.

[32] Following his account of the healing of Innocent, Augustine tells of the healing of a woman by the name of Innocentia who had breast cancer. He says that it is the practice of physicians either to remove the breast surgically or else suspend all treatment. "The latter course, they say, follows the advice of Hippocrates" (*City of God* 22.8).

[33] *City of God* 22.24, trans. Dods, p. 853.

According to the declamation the mother did not want one of her sons abandoned, but rather treated by conventional means, such as the prescription of a diet and regimen, the use of poultices, and the like (chap. 17). Laymen were conservative in medical treatment and there was no reason for them to assume that new treatments were better than old.[35] Whatever individual physicians may have thought, we have little evidence that the Roman lay public at any time expected much in the way of medical progress. There existed, moreover, in Edelstein's words, a widespread "opposition to medicine that treats organs rather than human beings."[36] One finds an emphasis in the declamation on the *vis medicatrix naturae,* the healing force of nature. Nature was expected to accomplish healing, aided perhaps by remedies that had been proven to be effective by practical experience and could be tailored to the individual, while experiment might be thought to circumvent nature and to frustrate the healing process. On the other hand, new treatments that seemed to be consistent with the principle of the *vis medicatrix naturae* are likely to have been accepted more readily.[37] The questions of risk and responsible action on the physician's part were primary matters of concern. The patient in antiquity had no guarantees by the state or by professional organizations of the integrity of the physician or even of his competence. The issue was complicated by the lack of medical licensure, drug regulations, and an effective means of seeking legal redress. All of these are available nowadays and do much to create public confidence in medical treatment.

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[34] Temkin, "Idea of Respect for Life," p. 12. This clash was present in the debate between the Dogmatists and Empiricists over the propriety of vivisection: see Ferngren, "Vivisection," pp. 274–76. The Dogmatists defended vivisection because it aided the advancement of knowledge. Celsus reproduces their argument: "Nor is it, as most people say, cruel that in the execution of criminals, and but a few of them, we should seek remedies for innocent people of all future ages" (*De Medicina,* Prooemium 26, Loeb translation 1:15). Roman lay opinion agreed with the Empiricists in their opposition to vivisection.

[35] Caution of the lay public regarding novel medical treatment has probably been a feature of many societies. According to Diodorus Siculus (first century B.C.), 1.82.3 (whose source was probably Hecataeus of Abdera, fl. ca. 300 B.C.), physicians in Egypt were not charged with the death of their patients if their treatment was in accordance with ancient written procedures. However, if they deviated in any way from traditional procedures and their patients died, capital charges could be brought against them because it was assumed that they could not be wiser than earlier physicians in their method of treatment. Compare Aristotle, *Politics* 1286a. For a discussion of the practice of confining treatment in Egypt and China to traditional rules, see H. Oppenheimer, "Liability for malapraxis in ancient law," *Trans. Medico-Legal Soc.*, 1910, 7: 98–107, especially pp. 98–100.

[36] Edelstein, "Distinctive Hellenism of Greek Medicine," in *Ancient Medicine*, p. 394, n. 14.

[37] Presumably this is true of most of the novelties of the innovative physicians (founders of new schools and the like), which are condemned by Pliny, that gained popularity in Rome (*Natural History* 29.5.10–11).

In a famous passage, Pliny writes of physicians: "There is no law to punish criminal ignorance, no instance of retribution. Physicians acquire their knowledge from our dangers, making experiments at the cost of our lives. Only a physician can commit homicide with complete impunity."[38] Pliny's sentiment is echoed elsewhere in classical literature and seems to reflect a common lay perception of the physician.[39] To what extent was the charge true? What legal means were available to the patient seeking redress against negligent or incompetent physicians? The answer seems to be that there were few.[40] A physician could be prosecuted for homicide under the provisions of the *Lex Cornelia de sicariis et veneficis* (81 B.C.), a law on murderers and poisoners that was still in force under Justinian (A.D. 527–65), which made poisoning a capital offense. A later application of the law stated that, if a drug that was intended for a remedy produced death, the person who administered it might be punished under the *Lex Cornelia.* It was presumably prosecution under this provision that was feared by the physician in Lucian's *The Disowned.*[41] In Roman law a physician was liable for damages when the victim was a slave. Under the provisions of the *Lex Aquilia* (a statute of the third century B.C. that dealt with damage done to another's property), compensation could be sought by the owner in the case of the death or injury of his slave. However, freemen had little legal redress in the case of injury by a negligent or incompetent physician. They might seek compensation for loss of wages or the cost of medical care under the *Lex Aquilia,* but since no valuation could be placed on a freeman's body, the physician could not be held liable for unintentional injury. "There was," writes Amundsen, "no penalty in Roman law for the negligent killing of a freeman."[42] Hence Pliny cannot be accused of exaggeration, in spite of his hostility to physicians. Except for a fear of being charged with homicide, the physician would have been deterred from experimentation on his patients largely by a concern for his reputation. The absence of a concept of tort in Roman law that could be applied to the injury or death of a freeman, caused by an incompetent or negligent physician, made physicians nearly immune from prosecution for malpractice. Knowledge of this may well have increased the Roman lay public's feeling of helplessness in the hands of a physician and their reluctance to be treated by novel or experimental procedures, whose results were unknown.

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[38] *Natural History* 29.8.18, Loeb translation 8: 195.

[39] Compare, e.g., Philemon (third century B.C.): "Only physicians and lawyers can commit murder without being put to death" (in John M. Edmonds, ed., *The Fragments of Attic Comedy*, 3 vols. in 4 [Leiden: Brill, 1957–61], 3A: 253).

[40] See Darrel W. Amundsen, "The Liability of the Physician in Roman Law," in H. Karplus, ed., *International Symposium on Society, Medicine, and Law* (Amsterdam-London-New York: Elsevier Scientific Publishing, 1973), pp. 17–31.

[41] See above p. 500.

[42] Amundsen, "Liability of the Physician," p. 24.

The Pseudo-Quintilian Declamation 8 is an unpretentious piece of rhetorical literature that deals with a wholly fictitious event. Nevertheless, it is of interest in revealing Roman lay attitudes to medical experimentation. One cannot, of course, press the declamation too far. Doubtless some of the sentiments expressed are intended to contribute to the melodramatic pathos of the piece. But enough of them can be paralleled elsewhere in non-medical Roman literature to justify taking much of the declamation as a faithful reproduction of views that were common amongst the Roman lay public. These include opposition to accepting professional medical treatment involving risk without consulting relatives and friends; and hostility to many forms of medical experimentation and novel treatment even on patients whose condition is thought to be hopeless. This hostility was the result of an aversion to accepting risk in therapeutics and the patient's feeling of helplessness vis-à-vis the physician. In part this was due to a fear of poisoning, in part to a fear of the knife, and in part to a distrust of the physician's proverbial curiosity and an apprehension of being victimized by his desire for new knowledge without the possibility of legal redress for the patient.

NOTES AND COMMENTS

PAUL BARBETTE, M.D.: A SEVENTEENTH-CENTURY AMSTERDAM AUTHOR OF BEST-SELLING TEXTBOOKS

Daniel de Moulin

The seventeenth century, known in the history of the Netherlands as the Golden Age, was also a flourishing period for surgery and anatomy in that country. As well as at Leyden with its already famous university, these two disciplines thrived in Amsterdam. The Amsterdam surgeons' guild was the most prestigious one in the Low Countries and the names of quite a few Amsterdam surgeons and anatomists were favorably known well beyond the country's borders. Medical visitors from abroad usually included both Leyden and Amsterdam in their study tours of the Netherlands. Some of them even stayed for a period of time, applying themselves to anatomy in particular. For example, the Dane Thomas Bertelsen, better known as Bartholinus, spent three years in Leyden (1637–40)[1] and his junior compatriot Niels Stensen or Nicolaus Steno discovered the ductus parotideus that still carries his name while he was living in Amsterdam in 1660 with Gerardus Blasius, professor of anatomy.[2]

One of the Amsterdam medical men of note in the middle of the seventeenth century was Paul Barbette. Barbette was not a Dutchman by birth, having been born in Strasbourg, where his family, which was Protestant, had acquired the right of citizenship in 1605. His year of birth was probably 1619, but the exact date is not known since the registers of births of the Reformed Church of Strasbourg prior to 1656 no longer exist.[3] It is said that he was the son of a surgeon, but I have not been able to confirm this. He matriculated as a student of philosophy in the University of Strasbourg in the year 1637–38 but left no further traces of his presence at that educational institution until 1642, in which year he gave a public disputation on smallpox and measles, with professor Melchior Sebitz in the chair.[4]

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[1] Jacob Schouten, *Johannes Walaeus,* with summaries in English and French (Assen: van Gorcum, 1972), p. 20.

[2] Josephus Gerardus Vugs, *Leven en werk van Niels Stensen* (*1638–1686*) *onderzoeker van het zenuwstelsel,* with summary in French (Leiden: Universitaire Pers, 1968), p. 10.

[3] G. Foessel, archivist of the town of Strasbourg, personal communication.

[4] *Disputatio de variolis et morbilis* . . . publici exercitii gratia in Argentoratensium Universitate proposita a Melchiore Sebizio medicinae doctore ac professore . . . respondente Paulo Barbette argentoratensi (Strasbourg: Joannis Philippi Mülbii, 1642). In the seventeenth and eighteenth centuries, students were required as part of their university training to discuss a theme set by the professor in a public disputation.

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Barbette did not graduate from Strasbourg. He obtained his doctor's degree three years later in Leyden, where he matriculated as "medicinae studiosus" on 17 October 1645, only to be granted a doctorate in medicine by Otto Heurnius, professor of medicine and anatomy, on 1 November of that year.[5] Since the graduation lists for the years 1610–54 have been lost, it is not possible to recover the title of his thesis, no copy of which seems to be extant in any Dutch library.

The whereabouts of Barbette between 1642 and 1645 are obscure. Unlike many of his contemporaries, he was very reticent about his personal history in his books. Biographical dictionaries state that he studied medicine in Paris and Montpellier, but the latter presumption can be ruled out with certainty.[6] In 1645 Barbette had his name entered on the register of the *Collegium medicum* in Amsterdam,[7] which entitled him to practice medicine in that thriving merchant city, and he did not fail to make his way. He was married in 1649; the couple had eight children, six of whom died at an early age. They were delivered by a midwife, in spite of their father being a physician.[8] This illustrates that obstetrics was still largely outside the practice of a physician at that time. Barbette was actively engaged in anatomical studies and also took a great interest in surgery although he never practiced that craft.

Barbette must undoubtedly have known most, if not all, of his medical and surgical fellow townsmen, but in his books he mentions only a few names of his professional friends. He had no hesitation, though, in mentioning his patients by name, as was customary at the time. He was on particularly good terms with François de le Boë Sylvius, who had likewise been born in Germany of French Protestant parents. Sylvius was a highly esteemed practitioner in Amsterdam, showing much interest in anatomy and chemistry. In 1658 he became a professor of medicine at Leyden where he won great renown as one of the proponents of iatrochemistry. Barbette dedicated his *Surgery* to Sylvius, praising the latter's right-mindedness, judgment without prejudice, tolerance and helpfulness, "virtues that are few and far amongst physicians."

Another close friend was apparently the surgeon Job van Meekeren, the author of a delightful collection of case histories illustrated with proficient drawings done by his own hand, which was published two years after his death.[9] Van Meekeren recorded that he and Barbette had conducted anatomical research together in the local St. Peters Hospital.[10] Moreover, he inserted the text of a letter written by him to Barbette, probably in 1654 or 1655, on the question of why patients who die following a head injury often appear to have a liver abscess at autopsy. In his reply, which was also published in Van Meekeren's book, Barbette explained the phenomenon quite rationally by means of the blood circulation, which, although discovered by William Harvey in 1628, was generally accepted in the Netherlands only in the 1640s.[11] In the same letter, however, Barbette manifested his adherence to the ancient belief in the vital spirits. In all his works, his physiological concepts illustrate the stage of transition medicine found itself in at the time: the principle of the circulation of the blood was accepted while ancient humoralistic concepts lingered.

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[5] Philipp C. Molhuysen, *Bronnen tot de geschiedenis der Leidsche Universiteit,* 7 vols. (The Hague: Martinus Nijhoff, 1916), 2: 294.

[6] Louis Dulieu, medical historian in Montpellier, personal communication.

[7] Isabella H. van Eeghen, retired vice-director of the Amsterdam Municipal Archives, personal communication.

[8] Paul Barbette, *Pestbeschrijving,* 4th ed. (Amsterdam: Jacob Lescaille, n.d. [1672]), p. 46.

[9] Job van Meekeren, *Heel- en geneeskonstige Aenmerkingen* (Amsterdam, 1668). Other editions appeared as follows: German, Nuremberg, 1675; Latin, Amsterdam, 1682. The second Dutch edition (1728) was recently reprinted, with an added introduction by Daniel de Moulin (Alphen aan den Rijn: Stafleu, 1979).

[10] The Amsterdam St. Peter's Hospital or Binnengasthuis dates from 1579. Until well into the nineteenth

In 1655, Barbette published his first book, *Chirurgie nae de hedendaeghse pracktijk beschreven* ("Surgery described in accordance with contemporary practice") which was a compendium. It was followed in the same year by an account of the plague epidemic which had visited Amsterdam in 1655, and by *Anatomia practica,* a treatise on surgical anatomy, in 1659. These three works were originally published in Dutch. A book on medicine, entitled *Praxis Barbettiana,* made its first appearance posthumously in Latin. It was edited, and heavily annotated, by Frederik Dekkers in 1669 in Leyden: it obviously aimed at the foreign students thronging Sylvius's classes. It was almost immediately translated into Dutch. All of Barbette's books passed through numerous editions, even as late as 1723 his collected works appeared in Dutch. They were also published in several other languages: his *Chirurgie,* his *Anatomia practica* and his plague treatise appeared in Latin, German, French and English, often bound together in a one-volume edition; the *Praxis* in English, German and French. A Latin version of his *Opera omnia,* first edited by Jean-Jacques Manget in 1683 in Geneva, was subsequently translated into German—in which language it went through various editions, a last one in 1718—and into Italian. Barbette's bibliography is in fact quite complicated.[12]

Johann Jakob Waldschmidt, professor of medicine and physics at Marburg, an ardent partisan of Cartesian mechanical postulates, published in 1695 by way of a supplement to Barbette's surgical work: *Notae in chirurgiam Barbette.*[13]

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century, it was the most important hospital in the Netherlands. It left its original site only in 1982, when it was incorporated into the new University Medical Center. The mostly nineteenth-century hospital buildings are still standing. See Daniel de Moulin, ed., *Vier Eeuwen Amsterdams Binnengasthuis* (Wormer: Inmerc, 1981).

[11] Van Meekeren, *Heel- en geneeskonstige Aenmerkingen,* pp. 32–39. It is quite common to find in medical works of the time, in addition to the text proper, one or more letters written by or to distinguished correspondents on scientific subjects which may or may not be related to the subject matter of the book. Such letters, actually short publications in their own right, are sometimes very valuable for the history of medicine. They are, however, far from accessible, as they are hidden in the works of sundry authors.

[12] According to John S. Billings, "the *Chirurgie* passed through ten editions and translations, while his *Opera omnia* were issued twenty-two times, in various languages." See Billings, "The History and Literature of Surgery," in Frederic S. Dennis and John S. Billings, eds., *A System of Surgery,* 4 vols. (Philadelphia: Lea Brothers, 1895–96), 1: 46.

[13] Johann Jakob Waldschmidt, *Opera medico-practica* (Frankfurt: F. Knochius, 1695), pp. 367–99.

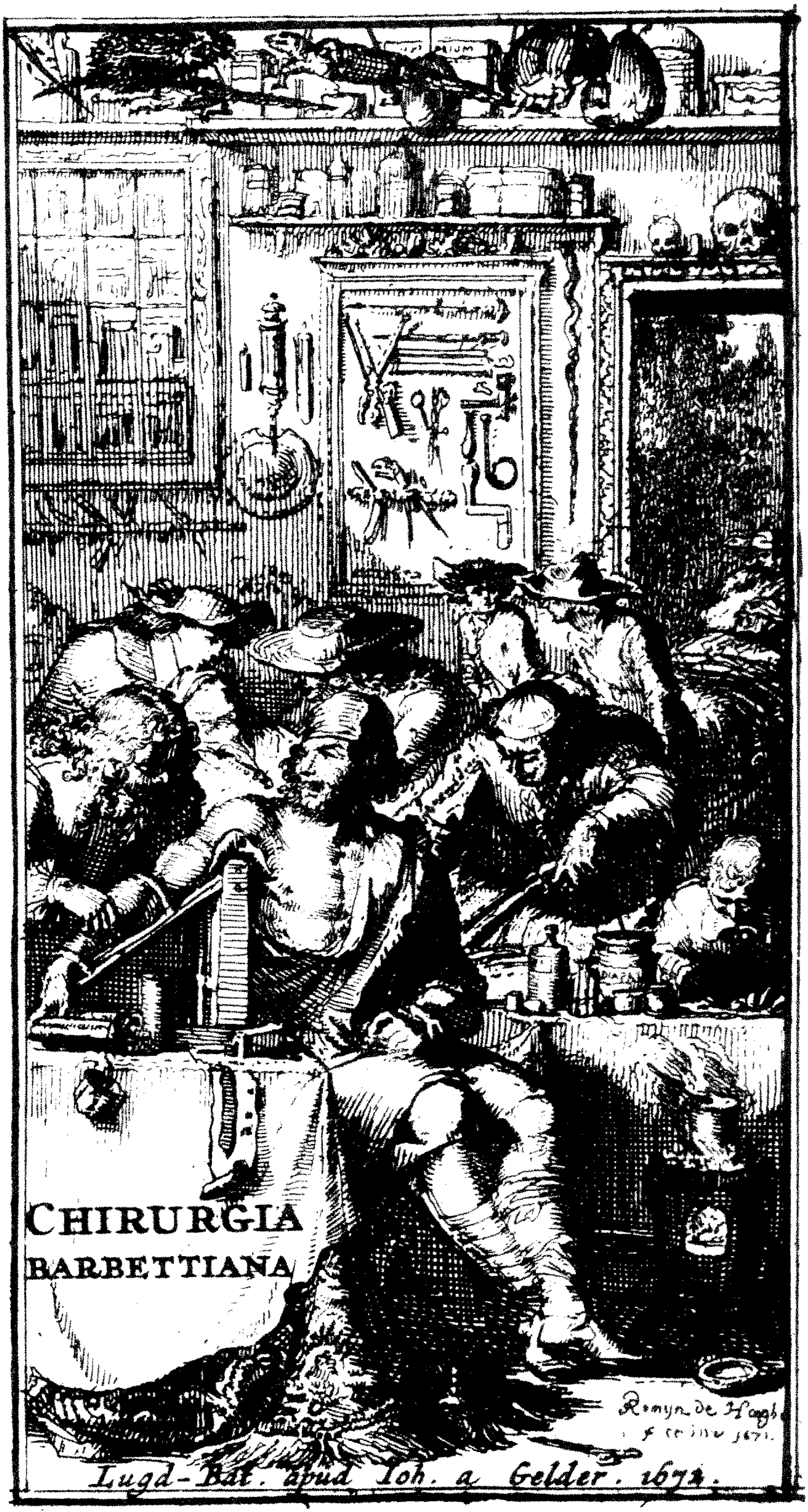

Fig. 1 Title page of 1672 Latin edition of *Chirurgia Barbettiana*. It was drawn and engraved on copper by Romeyn de Hooghe (1645–1708). Courtesy of the University of Nijmegen.

Apart from his books on surgery, anatomy, and medicine which procured him a widespread reputation, Barbette produced a few smaller pieces of writing of a polemical nature. They had a bearing on the sensational affaire De Bils.

In the 1660s, a Flemish nobleman by the name of Louis de Bils, then residing in Rotterdam, attracted attention by claiming that by a secret method of embalming of his own invention, he was able to preserve dead bodies for an indefinite length of time in a suitable state for anatomical dissection. He moreover asserted that he could do anatomical dissections on living animals with almost no loss of blood, just by ligating blood vessels at particular sites which, however, he did not specify.[14]

The invention of De Bils, who was neither a doctor of medicine nor a trained surgeon, met with admiration as well as opposition, as did his views on the anatomy of the chyle and lymph vessels and their functioning. The ensuing controversy spread to Denmark when Thomas Bartholinus was drawn into it by correspondents from the Low Countries.[15] Bartholinus was by then professor of anatomy in Copenhagen and one of the foremost authorities in the field. Barbette, too, took part in the discussion. In July 1661, he communicated to Bartholin the fact that De Bils probably used salt and alum in his embalmings. The results were not uniformly satisfactory, however, since some corpses became moist whereas others fell into dust. With regard to De Bils's bloodless dissections, Barbette thought it likely that the finer structures of the organs would be disturbed by the artificial blood congestion. This might explain the nobleman's contentions.[16] Bartholin's polite reply was largely concerned with rabies and did not pursue the subject of De Bils.

It was not the first time that Barbette had taken a stand against De Bils. Only a year before, he had contested the latter's conception that the mesenteric veins contain no blood, but only a turbid digestive juice which they absorbed from the small intestine to carry to the liver for further processing. Barbette challenged this view on the strength of an animal experiment which had demonstrated that it was impossible to blow air into the lumen of an isolated intestinal loop by way of a mesenteric vein, thus disproving the existence of an open communication between the lumen of the gut and the veins.[17] We will not go any further into this dispute which has been brought up here mainly to illustrate that in the second half of the seventeenth century experimental findings began to be used as arguments in scientific disputes.

Barbette did not restrict his experimental work to the question of whether or not the mesenteric veins communicated directly with the intestinal lumen. In his *Praxis Barbettiana* he wrote that he had extirpated the spleen in six dogs. With the exception of the first one, all of the animals had survived the operation.[18]

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[14] Jan R. Jansma, *Louis de Bils en de anatomie van zijn tijd* (Hoogeveen: C. Pet, 1919).

[15] Mart J. van Lieburg, "Nicolaas Zas (1610–1663): Een biografische bijdrage tot de geschiedenis van de chylus- en lymfefysiologie," in Antoon H. M. Kerkhoff, A. M. Luyendijk-Elshout, and M. J. D. Poulissen, eds., *De novis inventis: Essays in the History of Medicine in Honour of Daniel de Moulin* (Amsterdam and Maarssen: APA-Holland University Press, 1984), pp. 230–57, with English summary.

[16] Barbette, "De Bilsiani secretis judicium," letter dated 30 July 1661. Printed as Epistola XLVII in Thomas Bartholinus, *Epistolarum medicinalium . . . centuriae,* 4 vols. (The Hague: Petrus Gosse, 1760), 3: 194–97.

[17] Barbette, *Aenmerkingen op d'anatomische schriften van L. de Bils* (Amsterdam: J. Lescaille, 1660).

Let us now take a look at his works, keeping in mind that Barbette was a well-read physician who had a special interest in surgery. Turning the leaves of the small octavo-sized volumes, the first striking feature is the almost complete absence of references although Barbette claims to have read diligently the most eminent authors. As he explained to Bartholinus, he had composed his books on surgery and anatomy for the benefit of "tyrones" (beginners), not of "docti" (experienced men).[19] His aim was to present a practical synopsis of those time-honored and modern principles of the craft which he had found useful and correct.

His *Chirurgie* consists of four parts. The first part, entitled "Surgical handicraft," includes short chapters on surgical techniques in general such as bloodletting, incision, the application of leeches, the use of the cautery, the making of issues and setons, the performance of amputations, and so on, as well as chapters on the pathology, diagnosis and treatment of sundry ailments like fractures, dislocations, ruptures, dropsy, cataract, bladderstones and harelip. A comparatively large amount of space is allotted to fractures and dislocations, and to hernias, which illustrates their relative importance in the surgery of those days. In herniology, Barbette was probably the first to describe the semilunar hernia which, he wrote, was often taken for an abscess by ignorant surgeons and consequently incised.[20] He also called attention to a type of herniation in the back, which might perhaps have been the lumbar hernia described more fully by Jean-Louis Petit in 1774, and a rupture in the groin in such a way that the intestine is not driven into the scrotum, but finds its way between the skin and the muscles to the thigh. The latter condition might well have been a femoral hernia. His treatment

[18] *Idem, Praxis Barbettiana of genees-oeffening: Met aentekeningen door Frederik Dekkers* (Rotterdam: Fransois van Hoogstraeten, 1669) 4, 10 (chapter on prolapse of the uterus), p. 206. Barbette noticed that Dutch farmers would remove the uterus in three-months-old piglets by making an incision in the left side, ligating the arteries and veins in the same manner as when the spleen was taken out of dogs in experimental surgery. Dekkers, in his commentary, stated he had removed dog spleens himself. One bitch could no longer conceive afterwards, "which is why some ascribe to the spleen a virtue of producing blood suitable for procreation." Experimental splenectomy appears to have been popular in Holland at the time. Job van Meekeren, too, reported on one such experiment, successfully carried out by Henricus Balsy, M.D. (Van Meekeren, *Heel- en geneeskonstige Aenmerkingen,* p. 269), as did Frederik Ruysch (1638–1731), the well-known Amsterdam professor of anatomy, in his *Alle de ontleed- genees- en heelkundige werken,* 3 vols. (Amsterdam: Janssoons van Waesberge, 1744), 1: 106–7. The motive for it was never explicitly stated; the outcome was the appreciation that dogs can evidently thrive without their spleens. It is not possible to decide who was the first to perform this sort of vivisection in the Netherlands.

[19] Barbette, letter of 30 July 1661 (n. 16).

[20] *Idem, Chirurgie nae de bedendaeghse practijck beschreven,* 3rd ed. (Amsterdam: Jacob Lescaille, 1672), p. 26. Barbette did not in fact explicitly mention the linea semilunaris but described an abdominal hernia "under and beside the umbilicus, way above the groin." The linea semilunaris was first described by Adriaan van den Spiegel, *De humani corporis fabrica libri decem* (Venice: Ev. Deuchenius, 1627), p. 118. Quoted by Gerrit A. Lindeboom, *Adriaan van den Spiegel* (Amsterdam: Rodopi, 1978), p. 68. Spiegel made no mention of any hernia.

consisted of plasters and trusses, as was customary at the time, an operation being reserved for incarcerated cases that could not be reduced.

The chapter on dropsy contains the only illustration in Barbette's *Chirurgie.* It shows abdominal paracentesis using a separately depicted trocar modified by Barbette. This is the only instance of Barbette proposing an instrument of his own design.[21] Parts II, III, and IV of the book deal with tumors, wounds and ulcers, respectively.

Barbette's books abound with prescriptions for—mainly external—remedies which, based on his own experience, he assured his readers were really effective. This provision of formularies may well have contributed to the popularity his books enjoyed amongst practitioners.

His *Anatomia practica* should on the whole be regarded as an anatomical compendium for surgeons, although it also contains some physiology and pathology as well as hints on therapy. It is arranged traditionally, describing the body from head to toe, and this discussion is preceded by fifteen chapters on tissues in general; it has no illustrations. Barbette paid much attention to the question of the generation of blood. This question was closely connected with the function of the liver which at the time was the subject of heated discussion. He contested the established Galenic conception that blood originated in the liver from chyle conveyed by the mesaraic veins. Barbette held that chyle, after having entered the left subclavian vein by way of the recently discovered thoracic duct, would be converted into blood in the right ventricle of the heart.[22] This is one of several instances in which he shows himself a partisan of Sylvian physiology.

Barbette's *Praxis* is likewise a pocket-sized volume. It deals mainly, though not exclusively, with internal medicine, once again *a capite ad calcem,* along with tried and true remedies. The editor Frederik Dekkers is very well read in the literature in spite of his being only twenty-one years of age. Items of interest in the *Praxis* are the successful treatment of the peritonsillar abscess of Mrs. Lescaille, the wife of his Amsterdam publisher, by puncture with a sharpened little stick[23] and the author's statement that aneurysms occur almost exclusively in the neck although he had observed a few in the bend of the knee and the arm.[24] Barbette, who performed his own autopsies, was probably the first to describe a case of pancreatic necrosis: the patient, a "certain tailor in Kingstreet," had died "within a short

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[21] Barbette. *Chirurgie,* pp. 51–53. The trocar seems to have been invented in Italy by Joannes Baptista Cananus of Ferrara who, according to Amatus Lusitanus, treated a boy with hypospadia with a fine silver cannula "intra quam acus argentea continebatur." See *Curationum medicinalium Amati Lusitani medici physici praestantissimi,* 2 vols. (Venice, 1556). Quoted by Ernst Julius Gurlt, *Geschichte der Chirurgie,* 3 vols. (Berlin: August Hirschwald, 1898), 3: 426. It was in fact an instrument brought home from Italy by the Amsterdam surgeon Jacob Block that inspired Barbette to contrive his own design. Block appears in Rembrandt's *Anatomical Lesson of Doctor Tulp,* next to the anatomist.

[22] Barbette. *Anatomia practica* (issued in one volume together with *Chirurgie*—see n. 20—without indication of edition or date), pp. 62–79.

[23] *Idem, Praxis,* p. 50.

[24] *Ibid.,* p. 59.

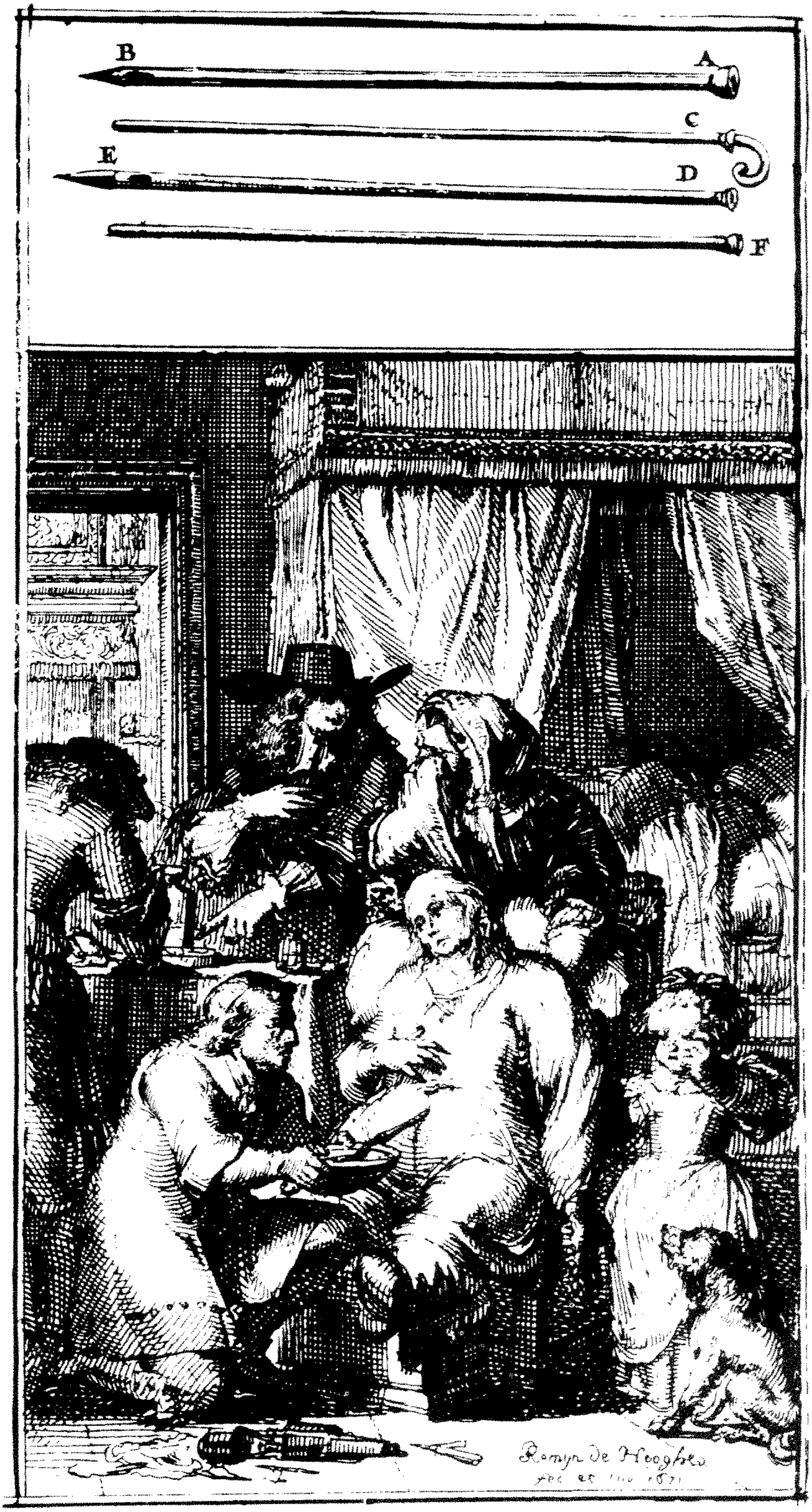

Fig. 2. Abdominal paracentensis from *Chirurgia Barbettiana*. Courtesy of the University of Nijmegen.

time while vomiting heavily."[25] He also came across a case of necrosis of the descending colon and another of volvulus of the small intestine in which the bowel had twisted at seven different sites.[26] Ileus was, he thought, almost always caused by too acrid a bile;[27] in cases of intussusception he somewhat diffidently proposed laparotomy.[28]

Paul Barbette was held in high esteem by many; for example, Bartholinus called him a "medicus notae famae et eruditionis anatomicae, cui plenam fidem dare possumus,"[29] Albrecht von Haller praised him as a "clinicus non minimae famae neque anatomes imperitus."[30] He died in 1665 at the relatively early age of forty-six, no portrait is known to exist. His books, however, continued to satisfy surgeons and doctors all over Europe until well into the eighteenth century.

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[25] *Ibid.*, p. 125.

[26] *Ibid.*, p. 185.

[27] *Ibid.*, p. 176.

[28] *Ibid.*, p. 180. His editor recommended the external use of bat's blood in such cases.

[29] "A physician of well-known reputation and grounding in anatomy whom we can fully trust"—see Thomas Bartholinus, *De hepatis exautorati desperata causa* (Copenhagen: D. Paulli, 1670), p. 640.

[30] "A physician of no small reputation nor an inexperienced anatomist" in Albrecht von Haller, *Bibliotheca chirurgica,* 2 vols. (Bern and Basel: Schweighauser, 1774–75), 1: 362.

NOTES AND COMMENTS

ERASISTRATUS, STUDENT OF THEOPHRASTUS?

John Scarborough

In his generally excellent *Galeno,*[1] García Ballester assumes a close link between Theophrastus of Lesbos (*c* 370–288/5 B.C.), the most famous pupil of Aristotle, and Erasistratus of Alexandria (*fl. c.* 260 B.C.).[2] García Ballester presumes not only great similarity in intellectual approaches between the two, but also that Erasistratus was a "pupil" of Theophrastus.[3] The immediate connection emerges, so García Ballester believes, through the employment of analogy by both ancient authors, but one is not provided with specifics in the ancient texts to back this claim.

The supposed link rests on flimsy foundations Only two ancient writers mention specifically the fact that Theophrastus taught Erasistratus, and they are contradictory. One notice comes in Diogenes Laertius, *Theophrastus* 5, 57, who gives a tradition, not direct evidence: "Some say that Erasistratus the physician was [Theophrastus's] student." Diogenes merely adds, ***kai eikos*** ("seems reasonable"). Nothing is known about Diogenes, except that he probably lived in the first half of the third century A.D., and put together his *Lives and Opinions of Famous Philosophers* from other second- or third-hand doxographical sources. Although he often identifies his sources by name, in this case he does not.[4] Thus Diogenes Laertius records an opinion held in his time, but does not set down particular attributions to back that opinion.

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[1] Luis García Ballester, *Galeno* (Madrid Ediciones Guadarrama, 1972), p 87

[2] P M Fraser, "The career of Erasistratus of Ceos," *Rendiconti dell'Istituto Lombardo di scienze e lettere,* 1969, *103* 518–37, and *idem, Ptolemaic Alexandria,* 3 vols (Oxford Clarendon Press, 1972), 1 347, argues that Erasistratus worked at Antioch. The thesis is rejected by Vivian Nutton, "Greek medicine dissected," *Hist Sci*, 1974, *12* 59–69, see esp p 61, and G E R Lloyd, "A note on Erasistratus of Ceos," *J Hellenic Studies,* 1975, *95* 172–75, who, however, writes, " the conclusion that at some stage at least, Erasistratus worked at Antioch should surely be accepted" (pp 172–73) The best study of Theophrastus remains O Regenbogen, "Theophrastos," in the Pauly-Wissowa *Real-Encyclopädie der classischen Altertumswissenschaft,* Supplement VII (Stuttgart Metzlersche, 1940), cols 1354–1562 For particulars of Theophrastus's interest in medicine, see John Scarborough, "Theophrastus on herbals and herbal remedies," *J Hist Biol* 1978, *11* 353–85

[3] García Ballester, *Galeno,* p 87 " a su discípulo Erasístrato "

[4] Hermann Diels, *Doxographi Graeci* (1879, rpt. Berlin Walter de Gruyter, 1965), pp 161-62 ["De Theophrasti in Laertio Diogene excerptus"] No mention is made of a connection between Erasistratus and Theophrastus

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The second source on the question is Galen (A.D. 129-after 210), who takes note of the tradition in his own day, and goes to some trouble to refute it.[5] The followers of Erasistratus had adopted Theophrastus as one of their purported inspirations, and claimed Theophrastus as one of their intellectual ancestors. Galen scoffs at this idea, writing, "I am amazed at you, Erasistrateans, who always praise Erasistratus and particularly for his association with Theophrastus . . . ."[6] Galen proceeds to demonstrate how ridiculous this connection would be, by pointing out how Aristotle's teachings were reflected by Theophrastus, and how the doctrines held by both Aristotle and Theophrastus conflicted radically with the opinions of Erasistratus.

Galen and Diogenes Laertius do not give any source for the tradition that had linked Erasistratus with Theophrastus, but had put down a doxographical convention which had grown up among medical philosophers that there might have been a connection. Galen suggests, in effect, that the link had been invented.[7] Diogenes simply records the tradition, apparently unaware of Galen's refutation, and says that the conventional tale would be reasonable. Diogenes's assertion "seems reasonable" receives no confirmation, either from his previously cited sources or from the doctrines represented in his *Theophrastus*. What appears is the slight notice of Erasistratus in Diogenes, who mentions the Alexandrian only one other time in the *Lives* (*Chrysippus* 7, 186),[8] which suggests confusion in the chronology of who taught whom in medicine during the late fourth and early third centuries B.C.[9] In *Theophrastus* 5, 57, Diogenes writes that Theophrastus might have been the teacher of Erasistratus, while in *Chrysippus* 7, 186, he says that Erasistratus "owed much" to Chrysippus. Although it is remotely possible that Erasistratus had both Theophrastus and Chrysippus as mentors,[10] the notice in Pliny, *Natural History* 29, 3. 5, put side-by-side with Celsus, *De medicina,* Prooemium, 8, gives a fairly lucid indication of a relative chronology. Pliny says that Erasistratus was the "pupil" (*discipulus*) of Chrysippus, and, furthermore, that Erasistratus was the son of Aristotle's daughter.[11] This shows that Aristotle and Theophrastus had become entwined in the muddled traditions around Erasistratus[12] Celsus, whose preface to the *De medicina* forms one of the valuable summaries of medical history before his time (*fl. c.* A.D. 14–37), notes the succession of famous names after Hippocrates: Diocles of Carystos, Praxagoras and Chrysippus, Herophilus and Erasistratus.[13] Finally, Galen identifies Erasistratus as a pupil of Chrysippus in a manner that leaves little doubt.[14]

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[5] These dates for the birth and death of Galen follow the fundamental research of Vivian Nutton, who has demonstrated that the traditional "seventy years" (derived from the *Suda*, a tenth-century Byzantine encyclopedia) is wrong See Vivian Nutton, "The chronology of Galen's early career," *Classical Quart*, 1973, n s *23* 158–71 (esp pp 159–61), and "Galen in the eyes of his contemporaries," *Bull Hist Med*, 1984, *58* 315–24 (esp pp 323-24)

[6] Galen, *An in arteriis natura sanguis contineatur* 7, 2 in C. G Kuhn, ed , *Claudii Galeni Opera omnia*, 20 vols in 22 parts (Leipzig, 1821–33, rpt Hildesheim G Olms, 1964-65), 4 729, and in David J Furley and J S Wilkie, eds and trans , *Galen On Respiration and the Arteries* (Princeton Princeton University Press, 1984), pp 174-75 The translation is that by Furley and Wilkie

[7] Wesley D Smith, *The Hippocratic Tradition* (Ithaca, N Y Cornell University Press, 1979), p 139, n 65

[8] Diogenes Laertius, *Lives and Opinions of Famous Philosophers Chrysippus* 7, 186 "There was another Chrysippus, a native of Cnidus, a physician, to whom Erasistratus says he was under great obligation " Translation by R. D Hicks, in Hicks, ed and trans , *Diogenes Laertius Lives of Eminent Philosophers,* 2 vols , Loeb Classical Library (Cambridge, Mass Harvard University Press, 1925), 2 295

[9] Fraser, *Alexandria,* 1 347, and 2 502, n 45 Furley and Wilkie, *Galen On Respiration*, p 254

[10] The question turns on when one dates the three men Theophrastus is fairly secure with the *c* 370–288 B C dates given above, Erasistratus is firmly dated only to the reign of Ptolemy II of Egypt (308–246 B C , joint ruler with Ptolemy I by 285 B C., succeeded to the throne 283/282 B C), and the only direct reference in the ancient texts linking Erasistratus alone with Ptolemaic Alexandria, is Caelius Aurelianus, *Chronic Diseases* 5, 2 50 (I E Drabkin, ed and trans , *Caelius Aurelianus On Acute Diseases and On Chronic Diseases* [Chicago University of Chicago Press, 1950], pp 938-39), Lloyd, "Erasistratus," p 175, n 22 Franz Susemihl, *Geschichte der griechischen Litteratur in der Alexandrinerzeit,* 2 vols (Leipzig Teubner, 1891-92), 1 799-800, was the first to propose the theory that Erasistratus was " Liebarzt des Seleukos " [p 800], restated by Fraser, "Erasistratus " Chrysippus is vaguer in time, with the sources agreeing that he is a generation before Erasistratus, who was probably in his prime at Alexandria, *c* 260 B C Fridolf Kudlien, "Chrysippos 4," in Konrat Ziegler and Walther Sontheimer, eds , *Der kleine Pauly,* 5 vols (Stuttgart Druckenmuller, 1964–1975), 1 cols 1170-71, gives a clipped summary

Although little can be determined about the doctrines and teachings of Chrysippus the Physician, who may have hailed from Cnidus,[15] the texts taken together suggest conclusively that he was the teacher of Erasistratus. The confusion created by the notice in Diogenes Laertius, apparently taken at face value by García Ballester, can be untangled by the listing of Aristotle's descendants provided by Sextus Empiricus Pliny gets right the essential facts in the relative chronology, while Galen's discussion of Chrysippus and Erasistratus firmly joins the two as teacher and pupil. Furthermore, Galen's sarcastic denial of Theophrastus with the Erasistrateans of his own time ensures the dismissal of Theophrastus as the teacher of Erasistratus. Chrysippus of Cnidus, as attested by ancient accounts and modern interpretations, was the primary mentor of Erasistratus.

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[11] Pliny, *Natural History* 29, 3 5 "Horum placita Chrysippus ingenti garrulitate mutavit [from the teachings of the Hippocratics] plurimumque et ex Chrysippo discipulus eius Erasistratus Aristotelis filius genitus" in A. Ernout, ed. and trans, *Pline l'Ancien Histoire Naturelle, Livre XXIX,* Collection l'Association Guillaume Budé (Paris Société d'Edition "Les Belles Lettres," 1962), p 21

[12] Sextus Empiricus, *Against the Professors* 1, 258, gives the details which straighten out Pliny's crabbed account. Aristotle's daughter was named Pythias, and she married three men Nicanor, a relative of Aristotle, Procleus [two sons Procleus and Damaratus, who studied with Theophrastus], and Metrodorus the Doctor, a pupil of Chrysippus of Cnidus, who also was the teacher of Erasistratus [one son, named Aristotle, after his grandfather] Pliny's genealogy is wrong, but his generational sequence is right. R. G Bury, ed and trans, *Sextus Empiricus,* 4 vols, Loeb Classical Library (Cambridge, Mass Harvard University Press, 1933–49), 4 146-47

[13] Celsus, *Prooemium* 8 "Post quem Diocles Carystius, deinde Praxagoras et Chrysippus, tum Herophilus et Erasistratus " in Philippe Mudry, ed and trans, with commentary, *La Préface du De medicina de Celse* (Lausanne Institut Suisse de Rome, 1982), pp 65-66 with references

[14] Galen, *De venae sectione adversus Erasistrateos romae degentes* 2 (Kuhn, ed., 11 197)

[15] Susemihl, *Geschichte,* 1 780 and 798, Kudlien in *Der kleine Pauly,* 1 col 1170

[redacted]

TEXTS AND DOCUMENTS

A FURTHER TESTIMONY TO HUMAN DISSECTION IN THE BYZANTINE WORLD

Robert Browning

Lawrence J. Bliquez and Alexander Kazhdan recently drew attention to four passages in medieval Greek literature which suggest that the practice of human dissection was not unknown to Byzantine doctors.[1] To these I should like to add a fifth, which is of particular interest since it occurs in an obituary notice of a doctor written by a man of letters who had considerable medical knowledge and who seems to have been a teacher of medicine at one stage in his career.

The surviving speeches and letters of Michael Italikos were recently edited, many of them for the first time, by the late Father Paul Gautier.[2] In the introduction to his edition, Gautier tries to reconstruct Michael's career. For our purposes it is enough to know that he lived in Constantinople in the first half of the twelfth century, that he refused an appointment as *didáskalos ton iatrôn* (teacher of doctors) offered him by the empress Eirene Doukas (ob. 1123), that he spent some time as a teacher in the Patriarchal School, and that not later than 1147 he became metropolitan archbishop of Philippopolis in Thrace.[3] Among his works is a *monódia* or memorial address on Michael Pantechnes,[4] one of the doctors who attended the emperor Alexios I Comnenus in his last illness in 1118.[5] Pantechnes held the office of *aktouários,* or court physician and head of the medical community of the capital. The speech, which was made to an audience of the deceased's medical colleagues, must be later than 1118 and earlier than 1147; a more precise date cannot be established.

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[1] Lawrence J Bliquez and Alexander Kazhdan, "Four testimonia to human dissection in Byzantine times," *Bull Hist Med,* 1984, *58* 554–57

[2] Paul Gautier, ed , *Michel Italikos Lettres et discours* (Paris Institut Français d'études byzantines, 1972)

[3] Gautier, *Michel Italikos,* pp 14–28, Robert Browning, "The Patriarchal School at Constantinople," *Byzantion,* 1962, *32* 194–97, *idem,* "Unpublished correspondence between Michael Italicus, archbishop of Philippopolis, and Theodore Prodromus," *Byzantino-Bulgarica* [Sofia, Bulgaria], *1* 279–97

[4] Gautier, *Michel Italikos,* pp 110–15

[5] Anna Comnena, *Alexiad* 15 11, in *Annae Comnenae, Porphyrogenitae, Alexias,* ed August Reifferscheid (Leipzig B G Teubner, 1884), pp 306 8, 311 21, B Skoulatos, *Les personnages byzantins de l'Alexiade analyse prosopographique et synthèse* (Louvain Bureau du Recueil Erasme, 1980), pp 209–10

Michael Pantechnes is not an unknown figure. He is mentioned by Anna Comnena in her account of her father's illness,[6] and is the addressee of ten letters of Theophylact Hephaistos, archbishop of Bulgaria, whose pupil he had been;[7] presumably it was rhetoric and/or philosophy which he studied with Theophylact, who was neither a practicing physician nor a teacher of medicine.

The speech begins with a long and laudatory account of Pantechnes' wide culture, of which a summary will suffice. He believed that the study of medicine called for an understanding of the principles of natural philosophy. He had studied grammar, history, rhetoric—his writings were distinguished by their style—mathematics, astronomy (he was familiar with the methods of astrology, but did not make use of them), music, the philosophy of Plato, Aristotle, the Skeptics and the Neoplatonists (but not their theurgy), and law. This was why the emperor entrusted his life to him

From now on I will translate rather than summarize the Greek text, silently correcting a number of passages in which Gautier has misread the cramped and difficult hand of the unique manuscript, from which I made a transcript some years ago, and of which I have a photograph:

> How skilled he was at discovering distinctions between diseases! How expert at revealing their initial causes, or their predisposing [*prokatarktikaí*], essential [*synektikaí*], and other causes, as doctors call them, and at distinguishing symptoms and their causes and the particular features of each! [He knew] what was a common disease both of the homoeomerous and the organic [tissues] How well he diagnosed pathological states and the part affected by them, partly through scientific principles [*epistemonikôs*] and from the essence of the matter, with the aid of the art of dissection [*anatomiké*], partly from signs and what the doctors call medical conjecture. Who was so swift in diagnosis and so successful in treatment? For he treated sick patients and illnesses of regimen [*díaita*] as if he knew nothing else He excised unnatural tumors and understood wounds as if he had practiced nothing else. He cleverly applied his hand to the wrist and had such an understanding of the pulse as if he had been trained in this alone He foresaw the outcome [of an illness] as if he had mastered this art alone. He surpassed the best surgeons in matters of regimen [*díaita*], and in matters of surgery the most distinguished practitioners of regimen, or in other words he overshot the most skillful with their hands by the mobility of his hand, and outran the most distinguished in regimen by the regimens which he prescribed He alone was foremost in all parts of the art Who was more dexterous than he in manipulating an instrument, be it *spathoméle* or *amphismíle* or *melotís*, and in applying bandages and slings of every kind, such as that which they call by the name of the wolf?[8] Who ever understood better materia medica, although

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[6] Comnena, *Alexiad* 15 11

[7] Theophylactus Achridensis, *Ep* 1 7, 9, 44, 47, 59, 72–75, 2 31, in Jacques Paul Migne, ed., *Patrologiae cursus completus series graeca,* 161 vols (Paris Seu-Petit-Montrouge, 1857–66) 126 321, 324, 460–61, 464–65, 477–80, 497, 500, 552–53

[8] Cf Galen, *De usu partium* 7 14 et alibi

> it is infinite and impossible to describe in words, or [what is mentioned by the dialecticians, into which they cast their arguments][9] or the measure of quantity or the form of quality, and, what is most difficult of all, the right use of drugs and the opportune moment to act How great he was in operations of dissection [*anatomikaí encheiréseis*], how great in the use of natural means and the understanding of the parts of the body. How well he knew the subtle speculations regarding the pulse He surpassed Archigenes,[10] outshone Diocles,[11] rivalled Hippocrates, and discovered even more than Galen, inasmuch as Galen was unaware of the strict arguments concerning the soul, as he says himself, while Pantechnes understood its nature, and began from the soul as first principle then went on to the body. He had studied every book, old and new, and discovered many a long-buried ancient who had contributed to the art The witch by spells and incantations inspired herself and raised Samuel for Saul from the bowels of the earth, as the many believe,[12] Pantechnes used no witchcraft, but only the greatest diligence and labor which defies description [to revive the learning of the ancients] [Here the text breaks off incomplete.]

This is no doubt an idealized and rhetorical picture of a Byzantine doctor typical of the twelfth century. But it is not for that reason to be dismissed as mere verbiage. That Pantechnes is stated to have practiced dissection is clear. *Anatomé* means "cutting up," i.e., dissection, and not merely "cutting" as in surgery. And *anatomikaí encheiréseis* is the title of Galen's major work on anatomical dissection, in which he recommends the use of human cadavers.[13]

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[9] The text is corrupt here, probably as a result of inadvertent omission of one or more lines

[10] Archigenes of Apamea, a contemporary of Hadrian See Fridolf Kudlien, "Archigenes," in Konrat Ziegler and Walther Sontheimer, eds , *Der kleine Pauly*, 5 vols (Stuttgart Druckenmuller, 1964–75), 1 507 (hereafter *Der kleine Pauly*)

[11] Diocles of Karystos, a younger contemporary of Plato, nicknamed "the second Hippocrates " See Fridolf Kudlien, "Diocles 7," in *Der kleine Pauly* (1967), 2· 52–53

[12] 1 Sam 28 8–25

[13] *Galen on Anatomical Procedures* *De anatomicis administrationibus*, trans Charles Singer (Oxford and New York Published for the Wellcome Historical Medical Museum by the Oxford University Press, 1956)

MEDICO-HISTORICAL NEWS AND ACTIVITIES

CORRESPONDENCE AND REPORTS

PEARL KIBRE (1902–1985)

The history of medieval medicine recently lost a distinguished contributor with the death of Pearl Kibre, professor emeritus of history at Hunter College and the Graduate School of the City University of New York. Pearl Kibre received her undergraduate education at the University of California at Berkeley, and her Ph.D. in medieval history from Columbia University. Her mentor was Lynn Thorndike, with whom she subsequently worked in close scholarly collaboration for many years. She taught at Hunter College from 1937 until her retirement in 1971, and at the Graduate School of the City University of New York from the foundation of the Ph.D. Program in History in 1964. After her retirement she maintained an office at the CUNY Graduate Center until her death, and continued to be active in research and writing, and in her generous scholarly advice to students and friends. She was a Fellow of the Medieval Academy of America, and a former President of the Fellows of that body. Pearl Kibre's scholarly interests were focused upon the institutional and intellectual history of universities in the Middle Ages and upon medieval science and medicine. On these subjects she was the author of numerous articles and several books, among which her *Scholarly Privileges in the Middle Ages* (Cambridge, Mass., 1962) was awarded the Haskins Medal of the Medieval Academy.

Pearl Kibre made a notable contribution to the foundations of the study of the Latin manuscript materials that constitute a large part of the record of science and medicine in the European Middle Ages. As the joint editor, with Lynn Thorndike, of *A Catalogue of Mediaeval Scientific Writings in Latin* (Cambridge, Mass., 1937, revised and augmented edition, Cambridge, Mass., 1963), she provided historians of medieval science and medicine with an invaluable and widely used research tool. Her own interest in the history of medicine was especially directed toward the medieval Hippocratic tradition. Her *Hippocrates Latinus,* a repertory of Latin manuscripts of Hippocratic writings and commentaries thereon, which appeared as a series of articles in *Traditio* between 1975 and 1982, was issued as a volume by Fordham University Press less than a month before her death. A number of her articles on medicine are included in her *Studies in Medieval Science: Alchemy, Astrology, Mathematics and Medicine* (London, 1984).

Dedication to scholarly research was the central focus of Pearl Kibre's life. In addition, her kindness and concern for her students, especially perhaps those who showed signs of sharing her research interests, knew no bounds. The present author remains immeasurably grateful for her instruction and encouragement.

NANCY G. SIRAISI

APPOINTMENTS IN THE HISTORY OF MEDICINE

American Institute of the History of Pharmacy. The American Institute of the History of Pharmacy will come under new direction in January 1986 when John Scarborough will succeed Glenn Sonnedecker at the University of Wisconsin-Madison as the fourth

Bull Hist Med, 1985, *59* 521–533

Director of the Institute since its founding forty-four years ago Professor Scarborough took up duties as historian of pharmacy on the faculty of the University of Wisconsin-Madison on 1 July 1985

Born in St. Louis in 1940, Professor Scarborough took graduate studies at the University of Denver and the University of Pennsylvania before receiving his Ph.D in history of medicine and Greco-Roman history from the University of Illinois in 1967. He then accepted a position in the department of history at the University of Kentucky In 1977 he was elected to the Hallam Professorship of History at the university. His position was expanded in 1981 to include a joint professorship in the history of pharmacy at the University of Kentucky College of Pharmacy.

In his research, Professor Scarborough specializes in pharmacy and medical care in general as they evolved in ancient Greece and Rome and the Middle Ages Among his publications are *Roman Medicine, Facets of Hellenic Life,* and the forthcoming *Pharmacy's Ancient Heritage. Theophrastus, Nicander, and Dioscorides.* He is currently working on a volume to be titled "Greek and Roman Pharmacy."

Professor Scarborough is editor of the *Society for Ancient Medicine Newsletter* and since 1977 has served as President of the Society Among other honors and awards, Professor Scarborough has received the Edward Kremers Award of the American Institute of the History of Pharmacy for distinguished pharmaco-historical writing.

University of Illinois at Chicago. Norman Gevitz has been appointed Assistant Professor of the History and Sociology of the Health Professions at the University of Illinois at Chicago. This position includes teaching, research and program development at the schools of allied health, dentistry, medicine, nursing, pharmacy, and public health Professor Gevitz received his Ph.D from the University of Chicago in 1980, and subsequently served as an assistant professor in the Department of Social Sciences, Illinois Institute of Technology He is the author of *The D.O 's: Osteopathic Medicine in America,* published by the Johns Hopkins University Press, and is currently engaged in completing two additional works for the Press, as editor and contributor to *Unorthodox Medicine in American Society* and as author of a forthcoming work entitled *Self-Care and American Medicine.*

Ball State University. Susan C Lawrence has been appointed assistant professor in the Department of History, Ball State University, Muncie, Indiana, where she has been charged with developing courses in the history of medicine and science. Professor Lawrence's research for her Ph.D. (1985) at the Institute for the History and Philosophy of Science and Technology, University of Toronto, was on the development of clinical teaching and research at the London hospitals between 1750 and 1815

University of Bern. Urs Boschung, M.D , was appointed to the chair of History of Medicine at the University of Bern, Switzerland, on 1 April 1985. This chair became vacant with the resignation of Professor Esther Fischer-Homberger in the summer of 1984. Professor Boschung was previously at the University of Zürich, where he had been appointed Privat-Dozent in 1982 and where he was the Keeper of the Medico-Historical Museum The new Keeper of this well-known museum, which is attached to the Institute of the History of Medicine at Zürich, is Christoph Mörgeli, lic. phil

HISTORY OF MEDICINE DIVISION, NATIONAL LIBRARY OF MEDICINE: RETIREMENT

Manfred Waserman, Curator of Modern Manuscripts in the History of Medicine, National Library of Medicine, has retired from the library after twenty years and moved to take up a position in the Department of Library Studies at the University of Haifa, Israel. Dr. Waserman was the first person to occupy the newly created position of Curator of Modern Manuscripts when it was instituted in 1965 by Dr. John Blake Since that time, with Dr. Waserman's guidance, the Division has greatly expanded its collection of modern manuscripts, especially in the area of the acquisition of institutional records. In his research, Dr. Waserman has been particularly interested in child health Readers of the *Bulletin* are grateful for the painstaking efforts of Dr Waserman and Ms Carol Clausen in producing the invaluable 50-year *Index* (1983) We wish him well in his new life in Israel

OPENING OF THE JENNER MUSEUM IN BERKELEY, ENGLAND

Edward Jenner died at his home, the Chantry, in Berkeley on 26 January 1823 He had returned to Berkeley after his stay in London with John Hunter, and he acquired the Chantry in 1785. Although he spent short periods in London and Cheltenham, the Chantry remained his principal residence. Sometimes described as a "cottage," the Chantry is a gracious fifteen-room house with extensive outbuildings and gardens In the grounds, screened by trees and flowering shrubs is the "Temple of Vaccinia," the small thatched hut in which Jenner vaccinated the local people (many photographs of the Chantry and Temple have been published, e.g., *Brit Med J,* Jenner centenary number, 1896, *1.* 1250, 1254) On 10 May 1985, over 200 people gathered in Berkeley to celebrate the official opening of the Chantry as the Jenner Museum and Education Centre

Although Jenner is buried in Berkeley and there is a memorial window to him in the parish church there was little tangible evidence of Jenner's association with the village prior to 1966 In that year, the Jenner Trust was founded largely at the instigation of Dr. A G M Campbell, a Bristol physician. Its aim was to ensure public awareness of Jenner and in particular to establish a museum in Berkeley, preferably in the Chantry which since 1885 had been the home of the successive vicars of Berkeley. In 1967 the Trust opened a small museum in the cottage which Jenner had built for James Phipps, his first vaccinee Some 10,000 people visited the museum each year In 1980 the Church authorities indicated that they were planning to rehouse the vicar and would be prepared to sell the Chantry, and the Trust, with the help of the British Society for Immunology, launched an appeal for funds. A major donation of $500,000 was made by Mr Ryoichi Sasakawa, Chairman of the Japan Shipbuilding Industry Foundation. Although little known in Europe and the United States, Mr. Sasakawa is one of the world's leading philanthropists and gave two million dollars to the WHO smallpox eradication campaign

Mr. Sasakawa officially opened the Museum with a gold key presented to him by Professor Bruce Perry, Chairman of the Appeal Trustees Among the guests were members of the Jenner family and many individuals and representatives of organizations who have fostered an interest in Jenner The Chantry has much more space in which to house the growing collection of Jenneriana, and will also exhibit material concerned with smallpox and immunology A particular feature of the Museum is Jenner's study which has been set out with artefacts owned by Jenner and furnished in contemporary style Conference facilities have also been provided, which it is hoped will also meet the needs of the local community.

Those intending to travel far to visit the Museum should note that it is closed from October to April each year and every Monday, as is the adjacent Berkeley Castle.

DERRICK BAXBY

ANNOUNCEMENTS

AMERICAN ASSOCIATION FOR THE HISTORY OF MEDICINE

Osler Medal Essay Contest, 1986. Students in schools of medicine and osteopathy in the United States and Canada and graduates of the class of 1985 are invited to enter the William Osler Medal essay contest The medal, which commemorates the famed physician's interests in medicine and the humanities, is given annually in recognition of the best unpublished essay on the historical development of a contemporary medical problem or a topic within the history of health sciences by a medical or osteopathic student To enter, send five copies of an essay of a maximum length of 10,000 words to the Chairman of the Osler Medal Committee Dr Ynez Violé O'Neill, Division of Medical History, Department of Anatomy, UCLA School of Medicine, Los Angeles, California 90024 The deadline for submission is *1 February 1986* Further information about rules and eligibility may be obtained from Dr. O'Neill

Shryock Medal Essay Contest, 1986. Graduate students in the humanities or social sciences in the United States and Canada, and those awarded advanced degrees in 1985, are invited to enter the Richard Harrison Shryock Medal essay contest The medal honors Richard Harrison Shryock, a pioneer among historians interested in the history of medicine, and the essay may deal with any topic in the history of medicine that recognizes the reciprocal influence of medical science and social, political and economic conditions The maximum length is 7,500 words. The winning essay may, at the discretion of the editor, be considered for publication in the *Bulletin of the History of Medicine* Entries (five double-spaced typewritten copies, with footnotes at the end) should be postmarked no later than *31 January 1986* and directed to the attention of the Chairman of the Shryock Medal Committee: Dr Daniel M. Fox, Health Sciences Center 4L-215, State University of New York, Stony Brook, New York 11794. Further details about the contest may be obtained from Dr. Fox

NATIONAL NEWS

American Institute of the History of Pharmacy. John K Crellin has been appointed the second Fischelis Scholar of the Institute. The purpose of the competitive appointment is to encourage humanistic or historical studies of the practice of pharmacy Professor Crellin plans to study pharmacists' attitudes toward herbal remedies and present his findings in a monograph tentatively titled "Herbal Medicine and Pharmacy· Perspectives on Professional Realities " He has published extensively in the history of pharmacy and medicine

Those concerned about ethics in pharmacy practice will be interested in obtaining two recent publications of the AIHP on the subject The first, the proceedings of a 1984 symposium, is entitled *The Challenge of Ethics in Pharmacy Practice* ($4 00), the second, *Can a Professional Ethos be Taught?* ($3 00), is the result of a workshop in conjunction with the Association of Colleges of Pharmacy Both booklets are available from the American Institute of the History of Pharmacy, Pharmacy Building, 425 North Charter Street, Madison, Wisconsin 53706-1508.

Berkshire Conference on the History of Women—Call for Papers. The seventh Berkshire Conference on the History of Women will be held on 19–21 June 1987 at Wellesley College, Wellesley, Massachusetts The theme for the conference will be "Beyond the Public/Private Dichotomy. Reassessing Women's Place in History" and proposals for sessions that explore how women's consciousness and political activities reflect the links between the public and private realms are invited. While proposals for individual papers will be considered, the Committee strongly suggests submission of proposals for complete sessions involving no more than two papers, one commentator and one moderator. These should include title and a one-page abstract of papers, and one-page vitaes of all participants with address and telephone number and a stamped, self-addressed postcard for the Program Committee's reply. Proposals (*three copies*) on U.S topics should be sent to Dr Susan Reverby, Women's Studies Program, Wellesley College, Wellesley, Massachusetts 02181, on non-U S topics to Dr Dorothy O Helly, Women's Studies Program, Hunter College, 695 Park Avenue, New York, New York 10021. They must be received before *1 February 1986* Comparative proposals may be sent to either of the above

Francis Wood Institute of the College of Physicians of Philadelphia. "One Hundred Years of Internal Medicine" will be the theme of the Institute's second symposium for physicians and historians to be held on 21–22 March 1986. Those interested in further information on the conference should address enquiries to Ms Roselind Valentin, Wood Institute, College of Physicians of Philadelphia, 19 South 22nd Street, Philadelphia, Pennsylvania 19103 (Telephone 215-567-4475).

Health Sciences History Museums Association. A new organization is being formed for those responsible for museum collections in the history of the health sciences in Canada and the United States The group aims to address issues such as cataloguing procedures, terminology, subject access systems, travelling exhibits, loans and a better awareness of available collections Committees have been formed to work on by-laws and a program for the annual meeting, to be held in concert with the AAHM meeting in Rochester in 1986 Patsy Gerstner and James Edmonson are serving as chairman and secretary-treasurer, respectively, until the 1986 meeting. For more information on the organization and the proposed meeting, write to Ms Gerstner or Mr Edmonson at the Howard Dittrick Museum, 11000 Euclid Avenue, Cleveland, Ohio 44106 (Telephone· 216-368-3648)

History of Military Medicine—Call for Papers. The American Military Institute and the Air Force Historical Association will hold a combined annual meeting at the Uniformed Services University of the Health Sciences, Bethesda, Maryland, on 4–5 April 1986 The theme of the meeting will be military, naval and aviation medical history. Thirty-minute presentations on these topics will be given and those interested in presenting a paper should submit 300-word abstracts no later than *28 February 1986* to Dr. Robert J T. Joy, Section of Medical History, USUHS School of Medicine, 4301 Jones Bridge Road, Bethesda, Maryland 20814-4799. Please include a one-page curriculum vitae with mailing address and telephone number CME credit is available for the meeting

History of Science Society. The History of Science Society held its annual meeting at Indiana University from 31 October–3 November Medico-historical topics discussed in sessions were "Channel Crossing. French Science and English Medicine in the Nineteenth Century", "Western European Medieval Medicine in its Social Context", "Modern Medicine and Psychology", "Custodial Medicine in the Nineteenth-Century American Asylum" and "Nursing and Science in America, 1875–1985."

Indiana. An exhibit commemorating Miles Laboratories' first hundred years was a recent display at the Indiana Historical Society. The giant pharmaceutical firm started as a small proprietary business in 1884 which marketed the home remedies of Dr Franklin L Miles. Among the items in the exhibit were samples of early products and advertisements. The exhibit was drawn from the Miles archives, which house one of American industry's oldest collections of business records, advertising materials and product samples.

Johns Hopkins Institute of the History of Medicine. The Institute sponsored two colloquia in September 1985 The first was "The Concept of Fever in Medieval Scholastic Medicine. Models to Explain the Mechanism of its Production," Luis García-Ballester (University of Santander, Spain) and the second, "The Medical View of Virginity in the Early Second Century A.D.," Jody Rubin Pinault (University of Pennsylvania)

Logan Clendening Traveling Fellowship in the History of Medicine. Applications are invited for the fellowship, which is of the value of $1,000 and tenable for three months during 1986. Registered students of any recognized school of medicine or osteopathy are eligible for the fellowship, which was established in the memory of the late Dr. Clendening and is intended to enable a student to travel anywhere in the world in order to study any aspect of medical history Application forms, which must be completed and returned by *15 March 1986,* can be obtained from Dr Robert P. Hudson, Chairman, Department of the History of Medicine, University of Kansas Medical Center, Kansas City, Kansas 66103.

Massachusetts. The Brockton Art Museum, Brockton, Massachusetts, is featuring an exhibition entitled "William Rimmer: A Yankee Michelangelo" from October 1985–January 1986 Rimmer, a nineteenth-century artist and teacher, was in addition a practicing physician and anatomist. Perhaps the most gifted sculptor in nineteenth-century America, he directed the School of Design for Women at Cooper Union, and taught at the Boston Museum School. He also practiced medicine and wrote extensively on anatomy. His beautifully illustrated text, *Art and Anatomy,* was published in 1877. After closing at the Brockton Art Museum, the exhibition will travel to the Cleveland Museum of Art and the Brooklyn Museum.

National Library of Medicine. Dr. Philip Teigen gave a seminar on "Taste and Quality in Late Galenic Pharmacology An Experiment in Interpretation" on 25 September 1985.

New York Hospital—Cornell Medical Center. The History of Psychiatry Section's series of fall seminars included Jacques M Quen, "The Criminally Insane, the Insane Criminal, and Psychiatry" 18 September; John Kerr, "Beyond the Pleasure Principle and Back Again: Perspectives on Freud's Death Instinct" 2 October; Michael Neve, "Shakespeare and the Psychiatrists" 9 October, Elizabeth Cooksey, "Containing the Mad· Moral Architecture and the Nineteenth-Century Asylum" 16 October; Judith M. Hughes, "Reshaping the Psychoanalytic Domain Object Relations as a Research Program" 30 October; Arthur Zitrin, "The Remarkable Dr Hammond" 13 November; Sander L Gilman, "The Struggle of Psychiatry with Psychoanalysis: Who Won?" 27 November, Emmett Wilson, "Did Strachey Invent Freud?" 11 December; and Phyllis Grosskurth, "Richard Re-visited" 18 December

Pennsylvania Hospital Medical Library. The Pennsylvania Hospital has recently re-catalogued its entire collection, and it is now available for research The collection was started in 1762 to meet the medical and scientific needs of the physicians and students at a time when Philadelphia was recognized as the center for medicine and science in America. While not developed to be a rare book collection, it includes many items in Austin's *Early Medical Imprints,* many volumes from the libraries of Benjamin Smith Barton and William Byrd, and eighteenth- and nineteenth-century works. It is one of the richest resources in early medicine in the United States belonging to a hospital

Rockefeller Archive Center. Now available from the Rockefeller Archives is *A Survey of Manuscript Sources for the History of Psychiatry and Related Areas in the Rockefeller Archive Center,* compiled by James E. Shelley This publication covers the years 1910–74 and lists relevant documents and correspondence in the Center's archives and manuscript collections, including materials on mental health, neurology, physiology, endocrinology, genetics, child development, sex research, criminology and psychology. This softbound booklet is available on request to interested scholars and research libraries from the Director, Rockefeller Archive Center, Pocantico Hills, North Tarrytown, New York 10591

University of Virginia, Claude Moore Health Sciences Library. Three valuable volumes were recently presented by alumni of the University of Virginia School of Medicine to the Claude Moore Health Sciences Library The books added to the Library's collection were Andreas Vesalius's *De Humani Corporis Fabrica* (second edition, 1553), René Laennec's *De l'auscultation médiate* (first edition, 1819 and first American edition, 1823). The Laennec volumes were donated jointly by Dr. Henry Eckert (Class of 1940) and his wife, Peggy, and Dr. William Bennett Bean (Class of 1935) and his wife, Abigail *De Humani Corporis Fabrica* and a model of Laennec's original stethoscope were the gifts of Dr Bean

William Beaumont Bicentennial. The bicentennial of William Beaumont's birth was marked by a symposium sponsored by the University of Vermont, the State University of New York at Plattsburgh, and the medical society and historical association of Clinton County It took place on 5–6 October 1985; the first day at the Vermont campus and the second at SUNY-Plattsburgh. Subjects treated in sessions were "William Beaumont, M D and Medicine in Vermont," "North Country Physicians," and "Women in Health Services in the North Country" The symposium was closed with an address by Genevieve Miller of the Johns Hopkins Institute of the History of Medicine entitled "William Beaumont, Pioneer Physiologist"

PROGRAMS OF MEETINGS

Appalachian History of Medicine Society, Johnson City, Tennessee

June 29, 1984: "William S Halsted of Johns Hopkins: A Medical Enigma," Peter D Olch

November 8, 1984 "American Health Quackery," James Harvey Young

February 26, 1985. "Revelation of the Hidden Figure in *The Scarlet Letter*," John Churchill

March 26, 1985. "The President Who Would Not Conveniently Die An Exploration of Andrew Jackson's Persistent Bad Health," Sharon MacPherson

May 9, 1985 "Robert Burton's *Anatomy of Melancholy*," Nicholas Dewey

Bay Area History of Medicine Club, San Francisco

February 13, 1985. "Johannes Brahms, 1833–1897: Music, Loneliness and Altruism," Peter F. Ostwald

March 13, 1985 "A Fanatic for Veracity: Sinclair Lewis's *Arrowsmith* and the Esthetics of Science," David A. Hollinger

April 10, 1985: "Resurrection in Toronto. Facts and Myths in the Discovery of Insulin," Michael Bliss

History of Medicine Society, West Virginia University, Morgantown

October 1984. "Malaria, Daniel Drake, and the Ohio Valley The Physician as Writer: Can Apollo be Served in Two Ways?" William B. Bean

November 1984. "Vitamin B12. A Vehicle for Medical History," Robert Schilling

December 1984 "Diagnoses and History. President Woodrow Wilson," Edward M. Steel

January 1985. "American Medicine's Public Image," John C Burnham

February 1985 "Nobel Prize Lectures of Cajal and Golgi," James Culberson and Dennis Overman

March 1985· "Poetic Licentiousness. Shakespeare and Syphilis," Gretchen Worden

April 1985 "The History of Blood Transfusion," Caroline Hannaway

Josiah C. Trent Society for the History of Medicine, Durham, North Carolina

September 5, 1985 "Development of an American Style of Psychiatry between the World Wars," John C. Burnham

September 26, 1985. "Transformation of American Psychiatry from Institution to Community, 1800–1950," Gerald Grob

October 24, 1985 "Doctors, Families, and the State: Civil Commitment Laws in Nineteenth-Century America," Ellen Dwyer

November 7, 1985. "Outpatient Care of Mental Disorders in the Nineteenth Century," Samuel B. Thielman

Mayo Foundation History of Medicine Society, Rochester, Minnesota

July 10, 1985· "The History of Transplantation," Sylvester Sterioff

Quinan-Cordell Medical History Club, Baltimore, Maryland
September 19, 1985· "Cold Breath Means You're Dead . . . Old Beliefs and Discoveries: Dr. Randolph Winslow's Personal and Professional Experiences in an Era of Medical Change," Sheila Pinsker

Section on Medical History of the College of Physicians of Philadelphia
March 14, 1985. "Medicine through the Lens of the Museum," Audrey B Davis (Kate Hurd Mead Lecture co-sponsored by the Medical College of Pennsylvania)
April 17, 1985 "The Physician and the Book in Early America, 1720–1820," Morris H Saffron (Samuel X. Radbill Lecture)

Society of Medical History of Chicago
September 3, 1985 "Osteopathic Medicine in Chicago, 1900–1985," Norman Gevitz

University of Virginia Medical History Society, Charlottesville
September 24, 1985. "The History of the Development of Pediatric Health Care in the United States," Barbara J Brodie
October 15, 1985. "Wade Hampton Frost· A Wider View of the World," Jack M Gwaltney
December 9, 1985: "Precursors of Perrier. The Mineral Water Trade in Eighteenth-Century France," Caroline Hannaway

Washington Society for the History of Medicine, Bethesda, Maryland
September 19, 1985 "Edward Churchill: From Surgeon to 'Surgeon to Soldiers,' " Eran Dolev, and "Evarts A Graham. Protagonist of Change in American Surgery," Peter D Olch

NEWS FROM ABROAD

Australasian Association for the History, Philosophy and Social Studies of Science. The Association has instituted an annual review entitled *Metascience*, the first issue appearing in 1984 The journal is edited by W R Albury of the School of the History and Philosophy of Science, University of New South Wales, P O Box 1, Kensington, N S W , Australia 2033, and is intended to provide a multi-disciplinary perspective on history and philosophy of science and to serve as a forum for critical debate. Plans are to publish research papers, discussion papers and reports on work in progress, critical essays on particular problems or bodies of literature, and critical essay reviews of recent literature

Cholera Hospital Restoration Project The Flat Holm Cholera Hospital Association has been formed to preserve the last surviving Port Sanitary Authority Cholera Hospital in Great Britain The hospital is located on Flat Holm, an island in the Bristol Channel between England and Wales, and was founded in the late nineteenth century for the isolation and treatment of suspected cholera cases on homeward-bound ships heading for the surrounding ports of Barry, Cardiff, Newport, Bristol and Weston-super-Mare It has been derelict for forty years The Association plans to restore it as a study center and museum of public health Donations are being sought for this purpose and may be directed to Mr Terry Turner, Treasurer, F H.C.H.A., % Welsh

School of Pharmacy, U.W.I.S.T., King Edward VII Avenue, Cardiff, Wales, U.K. One may become a member of the Flat Holm Cholera Hospital Association for £5 00 a year All checks should be made payable to the Cholera Hospital Association.

History of Immunology Symposium. A symposium on the history of immunology is planned for 5–6 July 1986 to precede the sixth Congress of the International Society for Immunology which meets in Toronto on 6–11 July It will bring together many of the outstanding immunologists of the generation that created modern immunology and give them the opportunity to write their own intellectual history. The program will cover all areas of immunology and will lay the foundation for the history of a field which has been almost untouched by historians of science and medicine For further information, write to Dr Pauline M. H. Mazumdar, Hannah Professor of the History of Medicine, Victoria College, University of Toronto, 73 Queen's Park Crescent, Toronto, Ontario M5S 1K7, Canada

International Academy of the History of Medicine. The Academy has announced the results of its 1985 elections New members from the United States are Gert H Brieger, Caroline Hannaway, John Scarborough and Francis Schiller

International Congress of History of Science. The Congress was held in Berkeley, on the University of California campus, from 31 July–8 August 1985. Among the papers presented in symposia and scientific sections were a number treating medico-historical topics, including the history of medical genetics, women in the medical profession, eugenics, psychology, traditional medicine and biology—east and west, early modern physiology and anatomy, biomedical science in the twentieth century, medicine (varia), and science, technology and medicine in Nazi Germany and imperial Japan

Islamic Organization for Medical Sciences—Fourth International Conference. Karachi, Pakistan, will be the site of the fourth international conference on Islamic medicine sponsored by the Islamic Organization for Medical Sciences, 9–13 November 1986. The conference will treat the heritage of Islamic medicine, with an emphasis on the history of Tibb al-Nabawi, applied research on medical practices exhorted or prohibited by Islam, and the healing art and Islamic concepts and duties thereof. Unpublished, original papers are sought for the conference and must be submitted by *31 January 1986* and typed in both English and Arabic. Authors (or one of a team of authors) of accepted papers will be provided with travel expenses and accommodation. For further details on the conference or "Notice to Authors" for prospective speakers, please write to: Secretariat, Islamic Organization for the Medical Sciences, Ministry of Public Health, P.O Box 5, Al-Safat, Kuwait

Japan. The tenth International Symposium on the Comparative History of Medicine—East and West took place on 8–15 September 1985 at the Fuji Institute of Education and Training. The theme of the symposium was "The History of Therapy" and the following papers were presented. "The History of Acupuncture," F. Fu (China); "The Development of Chemotherapy in Germany in the Twentieth Century," C Habrich (West Germany); "Semantic Ramifications of the Key-Concept Temperament According to Zakhira-Ye-Kharazmshahi," S. M. Haghi (Iran; fellow at the Kitasato Institute, Tokyo); "The Development of Traditional Chinese Therapeutics and Its Background in Early Modern Japan," H. Hirama (Japan), "The Cultural Exchange of Acupuncture

Between Japan and Europe," S Ishino (Japan), "Therapeutic Methods and Methodist Therapeutics in the Roman Empire," Vivian Nutton (United Kingdom), "Antibiotics in Twentieth-Century Therapeutics," John Parascandola (U.S.A.), "Introduction of Western Medicine and Its Adaptation in Japan," Shizu Sakai (Japan); "The First Bio-Medical Revolution in France (1848–1894)· From Molecular Asymmetry to Anti-Diphtheria Serotherapy," C. Salomon-Bayet (France) and "From Specificity to Universalism in Medical Therapeutics· Transformation in the Nineteenth-Century United States," John Harley Warner (U.S.A., fellow at the Wellcome Institute, London). The Symposium is organized by Professor Yosio Kawakita of Juntendo University and sponsored by the Taniguchi Foundation

Jerusalem, Israel Amongst other recognition, the ninetieth birthday of Professor Joshua O Leibowitz was marked with a special number of *Koroth,* the publication which he co-founded in 1952 and of which he is still editor. The commemorative issue (Volume 8, No 11–12) was edited by Professor Samuel S Kottek and contains a biographical sketch of Professor Leibowitz, his bibliography, and contributions from leading historians of medicine relating to his research interests under the broad headings "History of Medicine" and "Jews and Medicine " A second number in honor of Professor Leibowitz is planned for the subsequent issue (1986) to continue the topic of "Jews and Medicine "

New Zealand The first New Zealand conference on the history of New Zealand and Australian medicine will be held at Hamilton (south of Auckland) on 29–30 April 1987. It is being organized by the Waikato Postgraduate Medical Society and is to be held in conjunction with the centenary celebrations of the Waikato Hospital The themes of the conference will be the health of Maoris and aboriginals before 1850; health hazards of immigrant ships; development of asylum and hospital services; conditions of practice in the Victorian era, demographic and sociological effects of infectious diseases in the colonies, and training and registration of nurses in New Zealand and Australia Further information can be obtained from Dr. R E Wright-St Clair, Extramural Hospital, Private Bag, Hamilton, New Zealand

Society for the Social History of Medicine, Great Britain The Society's fall series of seminars was on "Medicine and the Poor Law." The following papers were presented: 11 October, "The End of Crisis Mortality What Part Did the Poor Law Play?" John Walter, 25 October, "Poverty and Lunacy· Some Thoughts on Directions for Future Research," John Walton; 8 November, " 'I'd Rather Have Been a Parish Surgeon Than a Union One': The Poor Law Medical Officer, 1750–1850," Irvine Loudon; 22 November, "Scotland, Medicine and the Poor Law," Stephanie Blackden, and 6 December, "Medicine and the End of the Poor Law," Anne Crowther A one-day conference, "From Public Health to Community Medicine" was held on 26 October at the Institute for Historical Research, London Speakers were. Dorothy Watkins, "What Was Social Medicine? An Historiography of the Concept: George Rosen Revisited", Charles Webster, "The Origins of Social Medicine"; Margot Jeffreys, "The Transition from Public Health to Community Medicine", Jane Lewis, "The Origins of Community Medicine", David Armstrong, "The Sanitising of Social Space in the Twentieth Century." The conference was closed with a panel discussion entitled "What Price Community Medicine?"

Spain. The Conseil de l'Europe in cooperation with the council of culture, education and science of the Valencian government, sponsored an intensive course on the birth of the basic medical sciences in the sixteenth to eighteenth centuries from a European perspective. The course was held at the University of Valencia, from 23–27 September 1985. Each topic was discussed by a European expert in the field The program included history of anatomy (A. M. Luyendijk-Elshout, The Netherlands), histology (B Zanobio, Italy), physiology (R. Toellner, West Germany), experimental medicine in Valencia (M.J. Báguena, J L. Barona and J.A. Micó, Spain), microbiology (Jean Théodoridès, France), pathological anatomy (M.J. Imbault-Huart, France), medical psychology (José M. López Piñero, Spain) and anatomical engravings in the library and medical historical museum of Valencia, Vesalius and Cajal (J L. Fresquet and V L Salvert, Spain).

Switzerland. The Swiss Society of the History of Medicine held its annual meeting in Biel as part of the 165th annual assembly of the Swiss Academy of Sciences on 3–6 October 1985. The Markus-Guggenheim-Schnurr Memorial Address was delivered by Hans H Walser and entitled "Wilhelm Griesinger—Von den Inneren Medizin zur Psychiatrie"

Wellcome Institute for the History of Medicine. A symposium on surgical practice and medical theory was held on 27 September 1985. Speakers were Christopher Lawrence, "Surgical Practice, Medical Theory", Roger French, "Richard Wiseman, Scrophula and Surgery", Malcolm Nicolson, "Giovanni Morgagni and Eighteenth-Century Physical Diagnosis"; Stephen Jacyna, "Physiological Principles in the Surgical Writings of John Hunter", David Hamilton, "Lister's Theory and Practice—A Successful Jumble?"; Lindsay Granshaw, "Divisions Over Divisions Anatomists, Surgeons and Rectal Surgery, 1800–1985"; and Joan Austoker, "The 'Treatment of Choice': Conviction and Practice in Breast Cancer Surgery, 1784 to 1985"

ROCKEFELLER FOUNDATION HUMANITIES RESIDENCY PROGRAM

Francis C. Wood Institute, College of Physicians of Philadelphia. The Rockefeller Humanities Residency Program for 1986–87 will enable the Institute to award two grants of $25,000 each to scholars who will spend one year in residence conducting research in the College library and participating in the Wood Institute seminar program. Grants will not be made for doctoral research For more information and application forms, write to Ms. Roselind Valentin, Wood Institute, 19 South 22nd Street, Philadelphia, Pennsylvania 19103.

GRANTS FOR RESEARCH

Medical College of Pennsylvania, Archives and Special Collections on Women in Medicine. The M. Louise Carpenter Gloeckner, M.D, Summer Research Fellowship will be available for the first time in 1986 in the amount of $1,200 to a researcher interested in using materials in the Archives and Special Collections on Women in Medicine of the College. There are no restrictions on eligibility Students and other beginning researchers are encouraged to apply For information and applications, which must be received by *15 February 1986,* write to Archives and Special Collections on Women in Medicine, The Medical College of Pennsylvania, 3300 Henry Avenue, Philadelphia, Pennsylvania 19129

Rockefeller Archive Center. The Rockefeller Archive Center of Rockefeller University invites applications for grants of not more than $1,500 to graduate students or post-doctoral scholars who are engaged in projects which require the use of the holdings at the Center The size of individual grants will be dependent upon the travel, temporary lodging and research expenses of the applicant. Applications for the 1986 grant year must be received by *31 December 1985* Enquiries about the program and requests for application forms should be addressed to the Director, Rockefeller Archive Center, Pocantico Hills, North Tarrytown, New York 10591. The names of recipients will be announced in March 1986

GRADUATE STUDY IN THE HISTORY OF MEDICINE

Johns Hopkins Institute of the History of Medicine. The Owsei Temkin fellowship and other fellowships for graduate study, either for the M.A. or the Ph D degree in the history of medicine, will be available 1 July 1986. Tuitions and stipends possible For further information, write to Dr. Gert H. Brieger, Director, Institute of the History of Medicine, The Johns Hopkins University, 1900 East Monument Street, Baltimore, Maryland 21205 Please include curriculum vitae and a statement of research interests Deadline for application: *15 February 1986*

University of California, San Francisco. The Department of History and Philosophy of the Health Sciences, University of California, San Francisco, announces the re-establishment of its program of graduate education in the history of the health sciences leading to both the M.A. and Ph D. degrees. Fields of study include the intellectual and social history of medicine and the health professions. Areas of special interest to the faculty include the history of disease, Latin American and modern European medicine, the history of neurology, of nursing, and of physiology Departmental offerings can be supplemented with courses given by the history department on the Berkeley campus Fellowships are available. Applications for the academic year 1986–87 must be received no later than *15 February 1986.* For further information write to Chairman, Department of History and Philosophy of the Health Sciences, School of Medicine, University of California, San Francisco U464, San Francisco, California 94143

BOOK REVIEWS

RICHARD P. WEDEEN. ***Poison in the Pot: The Legacy of Lead.*** Carbondale and Edwardsville: Southern Illinois University Press, 1984. xi + 274 pp. Ill. $24.95.

Fermented alcoholic beverages have provided solace to men and women in almost all civilized societies; and civilization, as we know it, could hardly have evolved without metallurgy. It is ironical, therefore, that a combination of these two early examples of human ingenuity gave rise to possibly the first and most destructive health disaster caused by a man-made toxin. This example of an unexpected and unwanted byproduct of technology caused epidemic and endemic outbreaks of serious and frequently fatal chronic plumbism, which can be traced unequivocally to consumption of leaded wines. The custom of sweetening and preserving wines with lead originated in the Roman empire, and did not abate until the nineteenth century. During that period, lead-adulterated wines, and to a lesser extent, beers, rum, and cider, claimed innumerable victims in Europe and America, and the impotence of the medical profession to prevent these deaths provides sobering insights for physicians and historians of medicine.

Because the divalent lead ion (Pb^{2+}) reacts strongly with sulfhydril groups of proteins, lead is capable of inhibiting most enzyme systems. This explains why lead is an effective bacteriocide and hence, a preservative of wine. It also explains the variable symptoms and the wide spectrum of diseases which chronic plumbism gives rise to and which the medical establishment has been slow to accept as being lead-related. Lead nephropathy is an example of such a condition, and Wedeen's clinical studies represent an important contribution to the modern understanding of the connection between lead exposure and kidney disease. Because occupational lead exposure is involved, the subject is a controversial one, and Wedeen's book raises the question of how medical opinion is formed and often maintained in the face of contrary evidence—as seen with the aid of historical hindsight.

The book is divided into four sections. The first deals with the early history of "Plumbed Wines," the second with saturnine gout ("Punch Cures the Gout"), and the last two with uroscopy ("The Pisse Prophets") and the history of kidney disease, particularly lead nephropathy. The author has assembled some 800 references and his text is laced with numerous quotations. While these are intended to enhance the authenticity of the evidence, this writing style occasionally obscures the argument and storyline. The large number of illustrations, on the other hand, enliven the book enormously. Many are part of the author's remarkable collection and the reproductions of the English engravings of gout patients reveal better than words can, the popular perception of the "English Plague," the doctors who confronted it, and the social class of its victims. One wishes that the publishers had found a way of presenting several of these prints in color and large format!

The story of lead-induced gout and kidney disease is told well and in great detail, but almost entirely from the clinician's point of view. In eighteenth-century England, it appears to have been caused primarily by leaded port wines, and non-clinical lines of evidence, such as measurements of the lead content of Portuguese port wines, the rate at which they were consumed and the low incidence of gout among drinkers of distilled spirits, in England and elsewhere, would have been welcome. Wedeen

Bull Hist Med, 1985, 59 534–571

makes a good case for re-examining the widely accepted diagnosis of porphyria to explain the symptoms of George III, as these appear to be equally consistent with plumbism (pp 87, 88) There are interesting accounts of a little known outbreak of renal failure and gout in Queensland, Australia, which was traced to widespread childhood lead pica (p 164) and to disease caused by the ingestion of leaded "moonshine" (p 174), to mention just two episodes among the many in the long and anguished history of lead poisoning The cast of characters ranges from ruthless quacks to perceptive physicians like George Baker, who traced the Devonshire colic to the consumption of lead-adulterated cider Baker's work challenged medical dogma, and because it threatened the cider industry of his native Devon, he was roundly vilified by his countrymen

The most disappointing portion of Wedeen's book is the early history of leaded wines and the resultant colic-paralysis epidemics The reader is alerted early on that rough going lies ahead when he is informed that "by 1200 B.C the Romans were skillful in the use of metals" (p 12)! Indeed, the historical account lacks perspective and rigor, the editing and referencing is careless, and many translations are inaccurate To illustrate these flaws we examine here one question of interest to historians of medicine, namely, who discovered that leaded wines were responsible for the widespread colic epidemics, known as the colic of Poitou (cf Josef Eisinger, "Lead and wine—Eberhard Gockel and the *colica pictonum*," *Med. Hist.*, 1982, *26*. 279–302).

Wedeen mistakenly credits the Swiss doctor Johann Jacob Wepfer (1620–95) with this achievement (p 21) and with using "chemical techniques to demonstrate that lead in wine was the source of many ills, including gout" (p 131) and nephritis (p 142). While Wepfer was indeed one of many physicians who reported colic-paralysis outbreaks in the medical literature, (Wepfer, *Paresin post colicam ex vino,* Ephem. Nat. Cur Dec. I. ann II 1671, obs 39) he actually blames the disease on the consumption of white wines, which, he contends, were more heavily sulfured than red wines Some Dominican Fathers who drank Alsatian wine, he adds, have blamed the colic on the use, in wine-making, of a sweet, sulfurated "fillet" (*taenia sulphurata*) which had been impregnated with various flavors and spices, bismuth, etc (*alitisque*) Wepfer goes on to say that Thomas Jordan had condemned bismuth as the source of the disease in Moravia; that Fernel and Palmarius had pointed out the potency of powdered lead when ingested, and that when the monks in a certain monastery had succumbed after consuming sour white wines, they blamed the colic on a curse (*maleficium*) in the wine. This passage provides the only mention of lead in Wepfer's paper, although in truth, the *taenia sulphurata* probably contained lead Wepfer subscribes to none of the above explanations, preferring a humoral one He had a keen theoretical and experimental interest in the action of poisons, particularly vegetable ones, and while in his writings there are comments on arsenic, antimony and mercury, there are, somewhat surprisingly, none on lead! (See Hans Fischer, *Johann Jacob Wepfer, 1620–1695. Ein Beitrag zur Medizingeschichte des 17. Jahrhunderts* [Zurich: n p , 1931].)

Eberhard Gockel, on the other hand, published a thorough clinical and epidemiological analysis of the origin of colic outbreaks in the Ulm monasteries in the 1690s, when cold weather and war provided greater than usual incentives for wine adulteration (Gockel, *Eine curiose Beschreibung der Wein-Kranckheit* [Ulm, 1697] and Gockel, *Vini acidi per acetum Lithargyri, cum maximo bibentium damno dulcificatione,* Ephem Nat. Cur Dec. III ann. IV 1697, obs. 30) His paper even contains the quantitative recipe which had been used for "correcting" wine with a lead additive and he clearly deserves the credit for identifying leaded wines as the usual cause of the colic of Poitou, which his contemporaries conferred on him It was, furthermore, Gockel who developed the sulfuric acid test for detecting lead in wine, which Wedeen, verbatim and erroneously, ascribes to Wepfer (p. 22). The "gruesome demonstration of the fatal effects of lead" performed by Wepfer's son-in-law, J J. Brunner, causes Wedeen to wonder how "the victim [human] for this catastrophic investigation was selected" (p 22), but his concern is presumably occasioned by a mistranslation, for the experiment was actually performed on a dog.

In summary, while Wedeen presents a richly illustrated and lively account of a fascinating chapter in environmental medicine, his book is, for the serious historian, flawed by inaccuracies

(I thank Ann E. Hanson for her help in translation).

Reviewed by JOSEF EISINGER, Molecular Biophysics Research Department, AT & T Bell Laboratories, Murray Hill, New Jersey

T V N PERSAUD ***Early History of Human Anatomy: From Antiquity to the Beginning of the Modern Era*** Springfield, Illinois· Charles C Thomas, 1984 ix + 200 pp. Ill $24.75.

When Charles Singer finished *The Evolution of Anatomy* in 1925, he was dissatisfied. Unlike another famous author, he did not sit back, survey his creation, and pronounce it very good. Instead, Singer declared that he intended his book only as an exordium As he further explained in the preface to the second edition, he hoped his introductory essay would stimulate others to undertake the composition of a more comprehensive and scholarly account

In the sixty years since his work was first published, no one has responded to Singer's entreaty, and no such extensive study has yet appeared. Professor Persaud, Chairman of the Anatomy Department at the University of Manitoba, is therefore to be congratulated for venturing into rugged, if not totally uncharted, terrain. His slim volume covers essentially the same ground as Singer's, tracing the development of the anatomical sciences from antiquity to early modern times, but begins and ends earlier.

Persaud examines the contributions of the ancient Egyptian, Chinese, and Indic civilizations in greater detail than Singer, and finishes his account with the publication of the second edition of Vesalius's *Fabrica* in 1555, instead of Harvey's *De Motu Cordis* in 1628. Another contrast with Singer's format is Persaud's inclusion of documentary references, although the slip cover claim of "extensive archival research" can hardly be sustained.

An original and interesting discussion concerns the medical and anatomical knowledge of ancient India Unfortunately, this and other sections of the book are marred by omissions, misprints, and inconsistencies. On page 25, for example, it is impossible to determine whether the Hindu physician, Charaka, lived in the second century B.C. or A.D. On page 96, the papal edict relating to the rendering of Crusaders' bodies is attributed to Boniface XIII rather than Boniface VIII. A caption to the *Margarita philosophica* illustration of cerebral ventricular localization informs us "the middle and posterior cells were labeled *Cogitativa* and *Estimativa* respectively" (figure 74, page 136), but the reader can easily discern the word "Memorativa" written across the rear ventricle

More serious than any single error in this book, however, is the outdated theme that dominates it. Persaud's "whiggism" displays itself clearly when he describes Galenic physiology as "a highly fanciful concept," and suggests it vanished "when Harvey announced his discovery of the circulatory system" (p. 67). This attitude impairs a valiant effort, and makes Singer's plea for a definitive study of the early history of human anatomy even more urgent.

Reviewed by YNEZ VIOLÉ O'NEILL, Division of Medical History, Department of Anatomy, University of California, Los Angeles, California

FREDERICK SARGENT II *Hippocratic Heritage: A History of Ideas About Weather and Human Health.* New York-Oxford-Sydney-Toronto. Pergamon Press, 1982 xlii + 581 pp. $65 00 (cloth); $25 00 (paperbound)

Despite its often elusive nature, the weather-health relationship has been of central concern to the medical profession throughout most of history To be sure, during the bacteriological era, this interest fell off drastically, and with that decline historical interest in the theme also slackened More recently, under the banner of human ecology, medical scientists have resumed and greatly expanded their examination of this and related environmental matters, a renewal which in turn has reinvigorated the interest of historians. Professor Sargent's large volume is a product of this revival.

The title of the volume, *Hippocratic Heritage,* accurately reflects Sargent's aim of illustrating the progression of medical views about weather and health from antiquity to the present He accomplishes this mainly by examining the writings of twenty-one figures, starting with Hippocrates and Suśruta. Focusing upon ideas, he has deliberately omitted certain applied facets of his subject, including that of climatotherapy. There has likewise been no attempt to deal at any length with the technical contributions of physicians to meteorology as a science, or with the roles of medical men in the institutional developments of this and related fields

Sargent, who died just as he was completing the manuscript of this work, brought an immense enthusiasm to his subject He also informed it with a large fund of technical knowledge gained from a long career in academic medicine as a professor of human ecology. In fact, the most original segments of the volume, and probably the most valuable, are his discussions of twentieth-century research and his appreciations of some of his teachers and peers in the field

The remainder of the work gains merit, it seems to me, principally from its role as a source book, with its extensive gathering of passages pertaining to the weather-health theme across historical time. There is also, of course, a good deal of textual commentary throughout. But Sargent breaks little new intellectual ground here, resting as he does very heavily upon his readings in the secondary literature.

The author's inordinate use of quotations from that literature, instead of paraphrasing it, is one of the book's conspicuous drawbacks Further weaknesses are its repetitiousness, its diffuse organization, and the inadequate allocation of space to some topics. Scholars will also greatly regret that Sargent's editors did not provide a subject index

Other omissions are equally regrettable and unaccountable Even allowing for the author's deliberate selectivity, it is hard to understand the rationale for not examining seriously the ideas of any Italians after Sanctorius, of any Frenchmen except Jousset, of any Russians, period It is difficult to conceive of a work on this topic which makes no mention at all of Humboldt, even though he was not a physician And it is incomprehensible that any discussion of eighteenth- to nineteenth-century American medical meteorology should give hardly a nod to Noah Webster and make not the slightest reference to such figures as Constantin Volney, Samuel Forry, and Edward Barton.

Still, for all this, the work is a helpful introduction to an important historical theme, a volume which provides a useful point of departure for further scholarly study

Reviewed by JAMES H CASSEDY, History of Medicine Division, National Library of Medicine, Bethesda, Maryland.

MAX MEYERHOF ***Studies in Medieval Arabic Medicine: Theory and Practice.*** Edited by PENELOPE JOHNSTONE London· Variorum Reprints, 1984 366 pp £28.00

The articles of Max Meyerhof were what first introduced me in any substance to the history of Arabic medicine. I well remember happening upon them from time to time (I had not yet encountered the bio-bibliography in volume 19 of the *Bulletin*) in a remarkable assortment of publications and on an equally astonishing range of topics. ophthalmology (his own medical specialty), obstetrics, pharmacology, medical-historical writing in classical Islam, ibn al-Nafīs, Maimonides—to name only a few The present volume reprints unchanged a selection of his papers that illustrates quite well this breadth of interest, it includes eleven of his more considerable articles, ranging in date from "New Light on Hunain ibn Isḥāq and his Period" (*Isis*, 1926) to "Sultan Saladin's Physician on the Transmission of Greek Medicine to the Arabs" (published in the *Bulletin* in 1945, the year of his death) To be sure, it is mildly surprising to find that all the articles chosen are in either English or French, for Meyerhof wrote a number of substantial pieces in German. This may conceivably limit the collection's utility somewhat: for example, five of the eleven articles have been reprinted from *Isis*, which on balance is probably easier for most American readers to obtain than are the German journals in which Meyerhof published widely until 1933. But the collection is still unquestionably a good introduction to the achievement of an important historian of medicine.

Reviewed by MICHAEL McVAUGH, Department of History, University of North Carolina, Chapel Hill, North Carolina

Sefer Hanisyonot: The Book of Medical Experiences Attributed to Abraham ibn Ezra. Editing, translation and commentary by J. O LEIBOWITZ and S MARCUS. Jerusalem The Magnes Press; Hebrew University, 1984. 345 pp. $28.00.

In the medical science of the Jews, from Biblical times through the medieval period, rational and magical elements reside in harmonious juxtaposition *The Book of Medical Experiences* (*Sefer Hanisyonot*), attributed to the twelfth-century Jewish grammarian-astrologer Abraham ibn Ezra and based on a tenth-century work by 'Abd al-Rahman b. Ishaq b. al-Haitham, is a treatise on magical and rational therapeutics in which magical cures far outweigh rational ones The present volume, which is the first published edition of Ibn Ezra's Hebrew text, consists of an appreciation of the treatise with a brief discussion of the authors, Arab and Jewish; a lucid chapter-by-chapter analysis of the contents of the work with references to pertinent Egyptian, classical, Biblical, Talmudic and Arabic sources and parallels; the Hebrew text with conspectus of manuscripts, discussion of the relation of the Hebrew text to its now lost Arabic source, and English translation with extensive commentary; and a bibliography in which the two editors' pioneering essays on the treatise figure prominently

Of the nine sections which constitute the *Sefer Hanisyonot,* the first, an extended theoretical consideration of the operation of drugs, is by far the most intriguing. Ibn Ezra explains therein his notion of the "proprieties" (*segulot*) which pertain to all diseases. Drugs are said by the author to operate by sympathy, or "propriety," one drug being drawn by some inexplicable force to one illness due to a mysterious correspondence between drug and patient. The "experiences" (modern "experiments") of the title refers then to Ibn Ezra's own observations of the beneficial effects of the drugs discussed, according to the proprieties which they exhibit. While Ibn Ezra's prescriptions rely quite heavily on Dioscorides, our editors note correctly that the operation of the humors is assumed in the treatise although neither the work of Hippocrates nor Galen is ever cited The remaining eight sections of the treatise cover therapeutic treatment of the body from head to foot, roughly according to the bodily systems

The profound knowledge of all periods of medical history which Leibowitz and Marcus bring to bear in their volume enables them to demonstrate to the reader that the philosophical underpinnings of Ibn Ezra's work are not mere reflections of magical quackery but stand in a tradition of ideas still believed in within recent memory. One recalls, for example, Paul Ehrlich's declaration of 1911 that therapeutic substances have specific "affinities" to certain diseases and organisms

A particular virtue of this edition which renders it so serviceable to students of the history of medicine is the editors' attempt throughout to explain the author's treatments in modern terms, judging their efficacy and rationale when discernible. Indeed, while the magical remedies recommended by Ibn Ezra are standard (transference, amulets, numerological cures), our author is remarkably astute in some of his rational observations as, for instance, his recognition of the aura of epilepsy and his correct statement that adult onset of epilepsy is more serious than childhood onset.

The volume is remarkably free of misprints For "encuouraged" (p 8) read "encouraged"; for "opression" (p 55) read "oppression"

Reviewed by STEPHEN NEWMYER, Department of Classics, Duquesne University, Pittsburgh, Pennsylvania.

ELIZABETH L EISENSTEIN *The Printing Revolution in Early Modern Europe.* Cambridge and New York Cambridge University Press, 1983 (abridgement of *The Printing Press as an Agent of Change,* 1979) xiv + 297 pp. Ill $34.50 (cloth); $9.95 (paperbound).

In 1984 the Cambridge University Press celebrated the 450th anniversary of the Press's charter to print, granted by Henry VIII It therefore seems appropriate that the Press brought out an abridged version of Elizabeth Eisenstein's *The Printing Press as an Agent of Change* at a time close to this anniversary

The Printing Revolution in Early Modern Europe reduces a two-volume, 794-page work to one volume which is about one-third the size of the original. There are a number of other differences between the two books: the abridgement added forty-one illustrations and two maps not found in the original The abridged volume is physically larger, with larger type and curiously large side and bottom margins. The wording of the text itself is essentially unchanged from the original, it simply has had large portions removed throughout. On the other hand, all of the references are missing from the new work, with the exception of a section at the end on "Selected Reading." The reader is directed to the original text if access to sources is desired

Eisenstein's premise is that the importance of the introduction of printing has been given short shrift by historians, and that insufficient attention has been paid to its major effects in such areas as communication, the Reformation and Counter-Reformation, and the scientific revolution A whole discipline has grown up around the history of the book as a physical object, but the relationship of printing to major areas of human endeavor has never been fully explored In what she terms an "extended essay, not a definitive text" Eisenstein proposes to outline some of these changes and to suggest areas for further research.

The Printing Revolution is divided into two parts The first discusses the characteristics of print culture, the new methodology, and relates these to changes in reading, learning, research, and most important, the preservation (and ultimately the correction, emendation, and standardization) of knowledge Part II explores the influence of print culture on larger, more general intellectual topics· the Renaissance; the contribution of printing to the spread and establishment of Protestantism (as both a "precondition" and a "precipitant" of the Reformation); and its impact on the dissemination of science Disappointingly for readers of the *Bulletin,* the abridgement omits discussions of the relationship between the new print culture and changes and developments in medicine, anatomy, and the printing of related literature Astronomy is the science chosen for emphasis here.

It is difficult to decide who is the intended audience of this abridged version. The original publication was extensively reviewed It was criticized quite strenuously for being derivative, for having relied largely on research in secondary materials, but the large number of references to examples which supported Eisenstein's thesis provided access to a wide-ranging literature. These references are all missing from the abridgement, and the text itself presupposes a substantial familiarity with the background of early modern history.

The importance of Eisenstein's work suggests that it should be read in the original publication, where all the scholarly apparatus is available Certainly anyone interested in the impact of the advent of printing on medicine would gain more from that edition than from this abridged version

Reviewed by NANCY WHITTEN ZINN, Head, Special Collections, The Library, University of California, San Francisco

THOMAS PALMER *The Admirable Secrets of Physick and Chyrurgery.* Edited by THOMAS ROGERS FORBES New Haven, Connecticut: Yale University Press, 1984 x + 221 pp $25.00.

Professor Forbes brings to our attention another medical commonplace book, this one compiled in New England near the end of the seventeenth century. Its title page bears the name of Thomas Palmer and the date 1696, but these facts may indicate ownership, or who the copyist was, as well as authorship. Like other commonplace books, it is a compendium of reading notes, digests of medical theory and practice, recipes (prescriptions), descriptions of the virtues of medicaments, and references to some "authorities" whom the compiler actually may have used or mentions in order to impress readers and patients.

As is also the case with other commonplace books (that by Elizabeth Coates Paschall in eighteenth-century Philadelphia is a notable exception), little is known about the presumptive author or the specific circumstances of the volume's compilation and use in the home or in medical practice The Thomas Palmer associated with this manuscript was born about 1666 in Massachusetts and spent all his life there, first as a clergyman and then as a successful physician—but even these details are unverified

In the introduction Forbes stresses the uniqueness of the manuscript and interprets it as an outgrowth of the internal development of sixteenth- and seventeenth-century medicine. However, his account of the medicine in these two centuries is too sketchy to bear such an interpretation In some cases it lacks proportion. For example, although Paracelsus has great appeal as a rebel, he did not dominate sixteenth-century pathology and therapy to the degree suggested here. He did have a large impact but was never able to displace Renaissance Galenism, which continued to influence pathology and therapy to the end of the seventeenth century, certainly at the level of medical care represented by this commonplace book, if not at the level of academic medicine. Furthermore, to call sixteenth-century medical thought somnolent is careless, for this is, of course, the century of Vesalius, Leonhart Fuchs, and Harvey's great predecessors and teachers. The account of Culpeper is more satisfactory because it is more detailed than other parts of the introduction and because it focuses attention on an important but neglected figure in Old and New World medicine.

The historical annotation is thin also. The glossary gives little information and few references to late seventeenth-century works, and the index penetrates to the level of sections, not sentences, so that anyone trying to trace all the references to a particular medicament or disease cannot do so. Reference to the text would also have been made easier had the index and glossary been combined. (There is a possibility the historical interpretation and annotation is not intended for historians but for a popular audience, that would explain not only the brevity of both, but also the two warnings to readers to exercise care in using the recipes because "some of the drugs may be harmful")

The manuscript of *The Admirable Secrets* has been lost recently Forbes acknowledges a predecessor, a certain Dr. Woody, who worked from the manuscript itself, but the present editor has worked from a photocopy which may well be a second- or third-generation reproduction, for there is a microfilm of the manuscript in the New York Academy of Medicine We are left to guess what are the actual relations between the original 1669 manuscript, the two reproductions, and the edition now published Have we Woody's transcription edited by Forbes, or Forbes's edition based on what is a second- or third-generation reproduction? Or something else? This is not to say a work cannot be edited from a reproduction, if the original is lost, just that an editor owes his readers an account of the work's manifestations and history In a related and equally important editorial matter, we do not receive a convenient and systematic account of editorial procedures In short readers are required to place too great a faith in the editor

Although brief in interpretation, historical annotation, and editorial disclosure, the chief value of this edition remains: it makes generally available another commonplace book, thereby hastening the day when a comprehensive interpretation of this problematic genre of medical literature can be made.

Reviewed by **PHILIP M TEIGEN**, History of Medicine Division, National Library of Medicine, Bethesda, Maryland

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MATEO SEOANE. ***Mateo Seoane y la introducción en España del sistema sanitario liberal (1791–1870).*** Edited and annotated by J M LÓPEZ-PIÑERO Madrid: Ministerio de Sanidad y Consumo, 1984 (Colección textos clásicos españoles de la salud publica, no. 12) 239 pp. (paperbound). No price given

The past ten years have witnessed the publication of many documentary collections related to Spanish medical historiography by national and regional government departments and universities. As a rule, these collections focus on historical criticisms of contemporary practice, proposals for reform, and lengthy codifications of public laws and the constitutions of schools and academies Historians of Spanish medicine now have available a wealth of printed sources that demonstrate that leaders in medicine were acutely aware of the weaknesses of their profession, and frequently given to composing elaborate schemes for its reform Most often reform was associated with the political structure and regulation of the profession As a result, the history of Spanish medicine is to a large extent a story that is inherently legal and political, intimately tied with the dramatic shifts in ideology and policy that characterized Spanish government in the eighteenth and nineteenth centuries.

This collection is the twelfth volume of a thirty-volume set of "classic documents" on the evolution of public health in Spain published by the Ministry of Health and Consumer Affairs under the direction of a variety of editors Mateo Seoane, the subject of this volume, was himself typical of Spanish medical reformers. a product of progressive schools, a farsighted critic, a participant in political strife even while criticizing the politicization of medicine, and a major influence in the creation of public health legislation

The book itself consists of a brief (twenty pages) summary of Seoane's career and his significance by the prolific medical historian, José María López Piñero, and the full texts of eight major documents Four are essays on the state of the medical profession and public health, part criticism and part advocacy. The rest are drafts of comprehensive public health laws written between the liberal interlude of 1820–23 and the culminating comprehensive public health legislation of 1855, of which Seoane was the principal author.

Seoane was convinced that modern public health policy, in nineteenth-century

Spain concerned exclusively with the control of communicable disease, required effective government regulation at the national level. Much of his career—and the documents in this volume—were dedicated to drawing up complex plans for a public health service designed to constrain epidemics and to maintain health statistics. He attributed the spread of epidemics to agents in the atmosphere, as opposed to direct contact, a model that was a useful precursor of an understanding based on air-borne germs His career—and the documents—culminated with the 1855 Organic Law on Public Health, the basis of a modern public health service in Spain.

Despite his recognition of the need for an active government role in public health, however, Seoane was also a strong advocate for professional autonomy, especially at the local level where more traditional interests and habits were well entrenched. Progressive education, the solution to so many problems in the eighteenth century, could only achieve so much, he argued, as long as the very structure of the profession rewarded laziness, bred insecurity and frustration, and provided no incentive to the practitioner to update his knowledge. His insights into individual motivation were significant: practitioners who were under contract to local governments thought of themselves and were perceived by those they served as patronage employees, creations and functionaries of government, not respected, independent professionals

Reviewed by MICHAEL E. BURKE, Department of History, Villanova University, Villanova, Pennsylvania.

J B. LAMARCK. ***Zoological Philosophy: An Exposition with Regard to the Natural History of Animals.*** Translated by Hugh Elliot. Introductory essays by David L. Hull and Richard W Burkhardt, Jr. Chicago and London: University of Chicago Press, 1984. lxvi + 453 pp $30.00 (cloth), $15 00 (paperbound).

This book gathers together Hugh Elliot's 1914 translation of Lamarck's *Zoological Philosophy,* a translation of Lamarck's introductory lecture to his *Système des animaux sans vertèbres,* and Cuvier's dismissive *éloge* of Lamarck. An introduction by Richard Burkhardt briefly sets Lamarck in the context of the French Enlightenment, sketches his career, and summarizes his ideas about organic change A second essay by David Hull discusses Lamarck's ideas as they were transmitted by Charles Lyell and Cuvier, and the responses they evoked. Hull surveys views on "soft inheritance" from Spencer through the American neo-Lamarckians to Kammerer and Lysenko, showing the longevity of Lamarckian ideas. He ends with an overview of modern evolutionary controversies, especially those involving the function of sexual reproduction He raises the interesting idea that although Lamarckian inheritance seems intuitively plausible in contrast to wasteful Darwinian selection, in fact Lamarckian systems may not have evolved because they would be maladaptive Too much plasticity is generally harmful

Given the popularity of neo-Lamarckian theories in science, it will certainly be useful to have this copy of Lamarck's work on hand One or two omissions may be noted, however There has been no attempt to annotate the main text to help the untutored reader, even when unusual terms are employed Lamarck's preliminary discourse, for instance, discussing the "moral" and the "physical" (*le moral* and *le physique*), shows that Lamarck saw his evolutionary theory as a resolution of the Cartesian mind-body duality, because he could demonstrate how mind evolved from matter. This context could have been made clear by a judicious footnote. (The introduction to the *Système* does have a few useful notes added) Most curiously, Burkhardt's references to *Zoological Philosophy* in his new introduction direct the reader only to the original edition of 1809 and not to the work reprinted here.

The introductory essays make no effort to discuss the context of the original translation either, or any peculiarities which the translation might show. Elliot did try to make a strictly literal translation, but he also admitted to deviations from literalism in his introduction of 1914 But here, even the date of the translation is omitted. The index (identical to Elliot's) omits both new introductions and the added lecture and *éloge,* making it much less useful than it should be In short, some more editorial attention would have helped the reader to judge David Hull's fair comment that what Lamarck said was indeed different from later views which have been labelled "Lamarckian"

Reviewed by SHARON KINGSLAND, History of Science Department, The Johns Hopkins University, Baltimore, Maryland

MARIE BOAS HALL *All Scientists Now: The Royal Society in the Nineteenth Century.* Cambridge and New York· Cambridge University Press, 1984 xii + 261 pp $49.50.

Historical studies of the Royal Society of London have focused overwhelmingly on the tangled story of its origins and early development in the seventeenth century Indeed Boas Hall is well known for her work on Boyle and Oldenburg, work bearing intimately on the early history of the Royal Society The nineteenth-century period of the Society's history has received only patchy attention from competent historians, and much of the secondary literature has been concerned with the issues surrounding Babbage's critique of English science and the Royal Society in 1830, and with the emergence of the British Association. The nineteenth-century history of the Society here receives its first systematic account Marie Boas Hall traces the transformation in the fortunes and activities of the Society from the somnolent meetings in the Presidential reign of Sir Joseph Banks, through the reforms which gradually (and in a suitably English manner) led to the burgeoning of the Society as a professional scientific academy, dominated by men such as George Gabriel Stokes, William Thomson (Lord Kelvin), and Thomas Henry Huxley

Boas Hall observes that she has eschewed innovative approaches to the writing of institutional history. This is traditional narrative history (and none the worse for that), which documents the administration of the Society and the sequence of Presidential elections, the duties of successive Treasurers and Secretaries, and the role of the Society in advising governments and in fostering a number of collaborative scientific initiatives. Tables listing the Society's officers, lecturers and medallists would have been a useful addition to the text, which does undoubtedly make a solid beginning for future historical research on the topic. The book does, however, have something of the tone of an "in house" history, though a highly competent one There is little discussion of specific cases where the actual role of the Society's *Transactions* in fostering significant research can be judged, for example, through discussion of the refereeing process. The place of the Royal Society in the evolving structure of nineteenth-century British science is discussed wholly in the Society's own terms Despite such limitations to the scope of the argument, Boas Hall's account of the history of the Royal Society in the nineteenth century is a useful addition to the historical literature.

Reviewed by P. M. HARMAN, Department of History, Furness College, University of Lancaster, Bailrigg, Lancaster, England

Le Cere del Museo dell'Istituto Fiorentino di Anatomia Patologica. Florence: Arnaud Editore, 1984. 272 pp. Ill. $50.00 (Distributed by The Owl at the Bridge, 25 Berwick Lane, Cranston, Rhode Island 02905)

This book is an attempt to acquaint the reader with the nineteenth-century pathological wax models in the Pathological Museum of the University of Florence. Written in Italian, the book succeeds in its primary aim, as the illustrations far outweigh the text in quality and quantity. It is the third in a series of publications on the wax models in Florence published by Arnaud. The first two volumes were *Le Cere Anatomiche della Specola* (1979) and *Le cere e le terrecotte Ostetriche* (1981). The volume under review lacks historical details about wax modeling and modelers. Thus, for medical historians, it should be used together with the 1979 publication.

The production of anatomical wax models in Florence originated with Felice Fontana (1730–1805). At the time such models were valuable as teaching aids because bodies for dissection were hard to find and organs putrefied quickly. Both scientifically and artistically the Florentine waxes are the best in existence. Some of the same modelers who worked on the normal anatomical waxes were responsible for the pathological group.

The pathological collection at the Museum consists of 116 wax models. Approximately 60 were done by Giuseppe Ricci. There is no biographical information on Ricci except for two references which the reader will have to follow up on his own. Most of the remaining models were made by Luigi Calamai and Egisto Tortori (1829–93), both of whom were also associated with La Specola.

The book has three brief introductory essays: 1) "The Wax Models in the Pathological Museum at the University of Florence"; 2) "The Pathological Museum and the Founding of the First Italian Chair in Pathological Anatomy in Florence"; and 3) "The Waxes." The beginnings of the wax laboratory at the Museum of Natural History, popularly known as La Specola (founded in 1755), are discussed briefly as is the collection at the Pathological Museum, which opened in April 1824. There is a short bibliography.

The illustrations chosen for the book show pathological disorders in their advanced stages, conditions rarely found today. More important, they are a visual historical record of the pathological entities existing at the time. There are 23 full-page color illustrations. On the facing page of each of these is the title of the model as it appears in the catalogue, the name of the modeler and a brief description of the pathology illustrated by the model. Following the color section are full-page black and white plates showing *all* 116 models to give a comprehensive idea of the collection, but with only the title and the name of the modeler. The plates are arranged by systems: integumentary, urinary, gastrointestinal, reproductive, locomotor, nervous, special senses and finally neoplasms.

Most likely the models shown in color were selected for their superior appearance or their striking depiction of pathology. They show a pallor that could be attributed to their being copies from post-mortem specimens, or to the nature of the wax or the photographic process A physician colleague, William Welton, feels that the models are accurate enough to be used for teaching purposes. Certainly all of these wax models (anatomical, obstetrical and pathological) are relatively unknown and deserve more recognition

I have only two negative comments about the book: the quality of the black and white plates is not as good as in the two preceding publications; and there is not enough historical information to make the book a good single source for the historian. This book would be a valuable addition to the libraries of medical schools and hospitals, history of medicine departments, and departments of pathology.

Reviewed by RUMY HILLOOWALA, Department of Anatomy, West Virginia University Medical Center, Morgantown, West Virginia.

CHARLES NEWTON PEABODY *Zab: Brevet Major Zabdiel Boylston Adams, 1829–1902; Physician of Boston and Framingham.* Boston: Francis A. Countway Library of Medicine, 1984 xii + 255 pp. Ill $17 50 (Distributed by the University Press of Virginia)

Although the study of medical history in recent years has grown rapidly in breadth and complexity, the doctor still stands at its center Because of this, good biographies of doctors, great or otherwise, are most welcome. This book is such a work. It is written with grace, insight, and warm, but not uncritical, sympathy The author and his subject have much in common Both are from old New England stock, both attended Harvard College (Zab was exiled to Bowdoin to finish his degree for reasons not entirely certain), both served as military surgeons, and both practiced in Framingham, Massachusetts These similarities are undoubtedly the source of much of Peabody's particular enthusiasm, but the life of Zabdiel Boylston Adams (II) is so fascinating and reflects so much of nineteenth-century American medicine and society that almost anyone who reads this book will find himself or herself engrossed.

Adams was one of those bright and ambitious young doctors from Boston who went to Paris to study when that city was the center of Western medicine, and then returned home to spread the knowledge, techniques, and attitudes learned there. However, it was the Civil War, the greatest of nineteenth-century American traumas, that exerted the most profound influence on his life Throughout this entire ordeal Adams served with the Army of the Potomac, first as a regimental surgeon and then as a field officer. He suffered four wounds and was taken prisoner once His letters and other accounts of this conflict are vivid and compelling They force one to realize what tremendous effort and suffering were required to preserve the Union and end slavery. After the war, like many another veteran, Adams became restless and moody and sought new surroundings. Despite his father's warning never to practice medicine in a rural setting, he took up residence in the village of Framingham Here he came to appreciate fully the contemporary dictum that medicine was the noblest of professions and the meanest of trades. He persisted, however, and became a very positive force in the town at a time when modern medicine was beginning to emerge He exerted particular influence on public health, medical forensics, and the founding of the Framingham Union Hospital. One caveat—Peabody all too readily accepts the allopathic prejudices in respect to medical irregulars However, this does little to diminish this excellent biography

Reviewed by **PHILIP CASH**, Department of History, Emmanuel College, Boston, Massachusetts

MARTIN S PERNICK *A Calculus of Suffering: Pain, Professionalism, and Anesthesia in Nineteenth-Century America* New York Columbia University Press, 1985. xiii + 421 pp $35.00.

This conceptually subtle book examines the response of the medical profession to the discovery of modern anesthesia Pernick argues that the state of the profession at mid-century best explains the ways in which physicians and surgeons accommodated themselves to the potential uses of such substances as ether, chloroform, and nitrous oxide, and that the possibility of painless procedures, in turn, figured prominently in a profound and long-lasting transition that the medical profession was undergoing.

The first of these contentions rests upon Pernick's analysis of the "Conservative" movement of the 1840s, which he associates with such men as Austin Flint, Oliver Wendell Holmes, Worthington Hooker, and Frank H Hamilton. In common with the organizers of the AMA, the Conservatives were struggling to reunify their profession, which had been staggered by the Jacksonian onslaught against traditional elites. Toward that end they promulgated an ideology of mediation between the extremes of heroic interventionism (the tradition that had come down from Rush) and naturalistic minimalism (then burgeoning in such movements as botanic medicine, hydropathy, and homeopathy). Pernick asserts that the Conservative outlook dominated mainstream medicine by mid-century and thus conditioned the profession's response to the new anesthetics when they were introduced.

The Conservative ideology called neither for rejection of anesthesia (the position of the naturalists and of those who felt pain essential to therapy) nor for wholesale acceptance of anesthesia (which smacked of quackery and risked runaway interventionism), but instead for each physician to treat each case by weighing the risks and benefits of anesthesia for each condition and each patient While, on the face of it, this seemed eminently reasonable, it had built into it the paradox that physicians were forced to discriminate among their patients, and in so doing they often had to rely on criteria that were impressionistic and cultural, as distinguished from scientific and medical Thus surgeons assumed that the hard-working poor were more inured to pain than the soft rich, the middle-aged more inured than the young, men more inured than women, blacks more inured than whites, and so forth Pernick's perusal of the available surgical records (though the records are lamentably thin) tends to bear this out. In deciding to administer or withhold anesthesia, surgeons behaved as they said they should in their theoretical journals

Pernick's second contention, that the advent of painless procedures helped bring about a profound transition in the nature of the medical profession itself, rests upon the author's hypothesis that American professionals shifted their outlook during the nineteenth century from believing that they had to inflict pain to help those they cared for (surgery without anesthesia would be a good example in medicine, whipping in the law, perhaps threatening damnation in the clergy) to believing that they could best secure their positions by working to relieve the pain (literal or metaphorical) of those they served To say the least, this is a mega-theory, and cannot be proved or disproved without a great deal of additional research and discussion But it is an intriguing and heuristic idea.

A Calculus of Suffering is full of excellent observations and perspectives Pernick alludes, for example, to the similarity between the Conservative approach to anesthesia and the utilitarian economics developed in Great Britain during the same era. The book is prodigiously well informed and up-to-date It contains fresh material on the longstanding debates about whether anesthesia led to an increase in surgery in the United States (it did), whether much of the increase was experimental or unjustified (not much of it was), and whether anesthetic surgery was superior in quality to patient-participatory procedures (in the long run it certainly was, though Pernick is aware of the loss of autonomy that comes with dependence on pain relievers).

The organization of the book tends to be a bit choppy, and it contains sections that might have been more effectively summarized But there is no question that Pernick has given us an excellent monograph that addresses big ideas and raises far-reaching implications It is a pleasure to read work of this quality

Reviewed by JAMES C. MOHR, Department of History, University of Maryland Baltimore County, Baltimore, Maryland.

WILLIAM BUDD ***On the Causes of Fevers (1839).*** Edited by DALE C SMITH Baltimore. The Johns Hopkins University Press, 1984 (Henry E Sigerist Supplements to the ***Bulletin of the History of Medicine,*** new series, no 9). xi + 164 pp. $9.95 (paperbound)

Dale Smith, in editing William Budd's essay, submitted for the Thackeray Prize in 1839, has provided a highly detailed history of the stages by which the specificity of typhoid fever was established, the disease distinguished from typhus, and its pre-microbiological etiology and mode of transmission identified. Surrounding the essay with a substantial introduction and afterword, Smith carries the account up to the publication of Budd's classical *Typhoid Fever* in 1873. The anonymous manuscript of this essay (Budd's first work on typhoid) was discovered in the National Library of Medicine In a useful appendix, the editor effectively establishes its authorship from internal evidence, but does not explain its provenance.

Budd at this stage (1839) was struggling, like most British fever doctors, to establish the identity of two forms of fever: typhoid and typhus, but unlike most of his contemporaries and compatriots, Budd had actually seen a discrete epidemic of "typhous" fever, characterized by ulcerations of the small bowel, in the constrained rural context of North Tawton, and separated from the confusing manifestation of typhus in the city slums of Great Britain. This had also been the experience of Bretonneau, fifteen years earlier in France, and building on Bretonneau's work, Pierre Louis had created a useful statistical association of symptoms which had made it possible to identify "typhoid" fever. Yet doubt and confusion remained British clinicians, bewildered by the simultaneous appearance in urban slums of both diseases, preoccupied with a variety of symptoms which they gathered haphazardly across the heterogeneous experience of a lifetime, and highly distrustful of the French statistical method, stubbornly held to the idea of a generic fever with a variety of manifestations dependent upon particular ecological circumstances Budd endeavored to establish the contagious nature of the disease in a substantial review of the circumstances that might affect the typhoid "poison," the person exposed, or both He was undecided as to the spontaneous origin of the disease, and endeavored, without much success, to establish the nature and etiology of the non-ulcerative fever. As Smith perceptively notes, the essay reflected both Budd's early appreciation that clear-cut epidemiological experiences made possible the differentiation of continued fevers, and Budd's confusion in applying this belief. It was this confusion, quite as much as Budd's radical emphasis on epidemiology, which lost him the prize in 1840

For some time longer the differentiation continued to be attempted on symptomatic and pathological, rather than etiological grounds. As the years went by and a succession of clinicians wrestled with the problem, the confusion gradually lessened, notably with the careful systematic work of Sir William Jenner in the late 1840s. Jenner bound together the symptomatic and pathological specificities with the specificities of epidemiological circumstances of the respective diseases, and included careful statistical analysis of clinical records and necropsy findings, which established the constancy of the distinctive characteristics of the two diseases. After that there should have been little more to be said, but it did not prevent a stubborn rear guard action on the part of the supporters of a common fever, down to and into the bacteriological era. Budd published an extensive study of typhoid fever in 1859 in which he, too, brought together the epidemiological and pathological evidence and careful scientific reasoning from the frequency of distinctive symptoms, rather than the "improbable possible" incidence of exceptions He also statistically documented the spread of typhoid from sewage contamination Thereafter his views came gradually to dominate the field, so that his monograph, *Typhoid Fever*, a gathering together of his papers on typhoid, is really the definitive statement on the disease before the identification of the microorganism.

All this the editor sets forth in a careful narrative In places the detail is excessive, especially when the account concerns minor resisters, whose significance is sometimes hard to determine. A few omissions are unaccountable· though Smith notes the significance of the therapeutic orientation of clinicians as one of the barriers to recognition of the epidemiological specificity of the disease *after* Budd wrote his essay, he fails to notice its at least as important significance in the resistance to Louis's statistical approach by the Broussais venesectionist school in the 1820s. Nor does he mention the contribution by Wunderlich's thermometry in the late 1860s and early 1870s to establishing the specificity of typhoid. Finally, is it really the case (p. 149) that the discovery of the immune carrier mechanism for typhoid "was still two generations away" when Budd died in 1880? It was discovered in 1900

This is a very useful, highly informative and easy to follow analysis of the history of a most important medical phenomenon It should become a standard reference for students of the history of fever

Reviewed by JOHN NORRIS, Division of the History of Medicine, University of British Columbia, Vancouver, B C , Canada

ROBERT WOODS AND JOHN WOODWARD (eds) ***Urban Disease and Mortality in Nineteenth-Century England*** New York: St Martin's Press, 1984 255 pp $27 50

Medical education in America, it has recently been suggested, concentrates on illnesses rather than patients, and so has become impersonal A similar criticism might be levelled at the approach behind this collection of scholarly essays. Facts and figures we have in abundance, but few faces. The human stuff of History is so lacking that this book leaves one apprehensive about the future of the history of public health as a branch of social history, for its uncompromising demographic-statistical methodology threatens to overwhelm rather than enhance, to cloud rather than illuminate the central arguments, and there is little effort to evoke a sense of time or place, or the realities of urban living or municipal reforms.

Casting its long shadow over the book is the research of Brown, McKeown, and Record, and especially McKeown's *The Modern Rise of Population* (1976) One of the central themes of that book is that roughly one half of the decline in death rates over the second half of the nineteenth century may be attributable to the spontaneous weakening of the virulence of certain micro-organisms and to sanitary improvements The weakening of micro-organisms cannot be clinically proven and must remain an interesting hypothesis (only Luckin in his precise and stimulating chapter on typhoid and typhus in London grapples with it)· it is the second of the causes (which McKeown had presented as an uncritically broad generalization) that is the inspiration behind this collection of essays and which is closely examined for London, Bradford, Manchester, and Birmingham.

What emerges is somewhat ambiguous—certainly sanitary reforms did result in declining death rates but not as uniformly or as early as McKeown suggested. In toto these essays will help stoke the fires of the "pessimist" school of social historians, for they confirm that significant urban reforms were implemented in working-class districts only very late in the century Of the essays, those by Bill Luckin and Gillian Cronjé (tuberculosis in England and Wales) are the most disciplined and maturely and crisply argued. Barbara Thompson has some splendid material on infant mortality in Bradford, but rather glides over the vital areas of the connection between heavy factory work and prematurity and immaturity and between artificial feeding and gastrointestinal illnesses. One looks forward to book-length studies from these three Robert Woods's meticulous analysis of age-specific mortality and the composition of registration districts offers important caveats for the historian and should stimulate more precise analysis of urban mortality in the future. More rigorous editing would have resulted in less repetition of theme and meandering (several of the essays read like abridged versions of larger works in progress), and, in one case, egregious grammatical errors.

One leaves this book both exhausted by the rather self-conscious statistical approach and also in some doubt about the ultimate possibility of pinpointing the causes for the decline in late Victorian death rates Take, for example, the case of a man whose real wages rise sufficiently for him to enjoy a better diet, whose workplace now has toilets, extractor fans and filters, and separate eating facilities, whose house is fully drained and whose bedding is periodically fumigated or disinfected, whose food is less contaminated and water purer, and whose standards of personal hygiene have been improved by the persistent ministrations of health visitors—is it possible to isolate the exact influence of any of these improvements upon his longevity? And, given the variety of improvements and the changing patterns of migration and so resistance to disease, are "major" or "significant" social reforms really necessary or will a multiplicity of quite small changes tip the balance? Perhaps the contributors to this book should embrace more confidently the multi-causal approach In their quest for specific and major causes, they pass over three probable influences on the declining urban death rate—the replacement of dung heaps and cesspools by the efficient dry closet system, improvements in work conditions, and perhaps most important, small but collectively significant improvements in domestic hygiene. All need greater exploration, especially the latter, for these essays suggest that only when public health becomes private—that is, only when the thresholds of dwellings are crossed—will we be able to gain a closer understanding of the still elusive causes of the remarkable decline in late nineteenth-century death rates.

Reviewed by A. S. WOHL, Department of History, Vassar College, Poughkeepsie, New York

DUDLEY SNOW *The Progress of Public Health in Western Australia, 1829–1977.* Perth, Australia: Public Health Department, 1981. xvi + 185 pp. Ill. $US19 00 (paperbound) (Distributed in the U.S by International Scholarly Book Services)

In spite of the title, the author states "In no sense can this be regarded as a history of public health in Western Australia" (p. xvi). And I must agree with him. However, the book does contain a great deal of information which is not readily available elsewhere, and it does make an original contribution to the epidemiology of typhoid in Australia by publishing for the first time an account of the 1958 City Beach outbreak in Perth which Snow had traced to a faulty sewer outfall, contaminated by carriers from the goldfield epidemics of 1895–1910, who were currently living in the local asylum. Typhoid dominates the book (36 out of 136 pages of text) possibly because "the protracted epidemic during the goldrush (1890–1910)—of over ten thousand cases could well have been among the greatest of all time" (p 89) The selection of the remaining topics is idiosyncratic Tuberculosis, venereal disease and asbestos related diseases (a major problem for Western Australia) are purposely omitted.

A weakness of the book is the absence of any account or analysis of social and political factors affecting public health This follows from Snow's belief "that health and health education are largely non political matters" (p 119) For a man who spent twenty-five years in the Department of Health, ten of them as Deputy Commissioner, such an attitude is rather surprising because he had been involved in the highly political polio vaccination and fluoridization programs and in the Health Education Council and the Australian Health Association To anyone wanting basic epidemiological data on Western Australia, or helpful chronologies of governments and health ministers, and so on, or legislation relevant to public health, this book could be a boon. In particular, Appendix I (pp. 139–73) which consists of five articles written by Snow on "The History of Some Communicable Diseases in Western Australia (1828–1951)"—originally published in the Health Commissioner's Annual Reports 1951–55—provides easy access to data not readily available elsewhere. The reports cover all the usual diseases as well as one or two exotic ones In short, the book chronicles a rather unusual selection of public health matters and provides some very useful data on the changing incidence of infectious diseases in Western Australia. It will appeal most to people with a medical background

Reviewed by DIANA DYASON, Senior Associate, HPS Department, University of Melbourne, Australia

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NANCY TOMES *A Generous Confidence: Thomas Story Kirkbride and the Art of Asylum-Keeping, 1840–1883.* Cambridge and New York: Cambridge University Press, 1984 xv + 387 pp. $39 50.

The asylum was the key feature of nineteenth-century European, British and American psychiatry, and within the asylum, moral therapy a fundamental therapeutic modality. It has been more than two decades since the late Michel Foucault insisted that, far from being an unalloyed humanitarian and scientific triumph, moral therapy was simply a more subtle form of restraint than the chains and fetters it was to replace In the nineteenth century, psychological restraint in the guise of social conformity became psychiatry's touchstone of therapeutic success.

Foucault's work has been extremely influential in the historiography of psychiatry, but if Nancy Tomes's fine monograph is any indication, we are now entering a post-Foucaultian era. This does not mean a return to the old heroic literature of increasing objectivity, inevitable progress, and purity of medical motive It does mean a greater awareness of the complexity of language (even "scientific" language), more willingness to look at patients as well as their doctors, more stress on "failure," even noble failure

Tomes's primary focus is the Pennsylvania Hospital for the Insane in Philadelphia and its long-time medical superintendent Thomas Story Kirkbride (1809–1883). Kirkbride was a dominant figure in the formative period of the psychiatric profession in the United States, and his hospital widely regarded as one of the best in the world A Quaker, who at one time seemed destined for a career in surgery, he acquired chance psychiatric experience at the Friends Asylum in Frankford, Pennsylvania, while waiting for a resident medical post to fall vacant at the Pennsylvania Hospital He successfully practiced medicine and surgery for several years in Philadelphia until the removal of the psychiatric wards to a separate, purpose-built site in 1840 prompted him to apply successfully for its superintendency He stayed there until his death forty-three years later, so his career spanned the optimistic phase of asylum psychiatry, and he lived to fight a rear guard action against the critics of the asylum who by the 1870s were gaining ascendancy.

Kirkbride emerges from Tomes's analysis as a creative and sensitive man, yet firmly rooted in the values and professional ideals of his time. Those ideals accorded to medicine, and particularly to psychiatry, a normative role, and granted the asylum an important regenerative function. Architectural design and internal organization were basic to successful asylum practice, and Kirkbride's views on these matters were widely influential Proper separation of patients (male from female, of course, but also noisy from quiet, violent from docile, "dirty" from clean) meant that within the hospital, patients regularly moved from ward to ward as their condition progressed or deteriorated. In essence, "moral therapy" consisted in giving the patient as much responsibility, autonomy and freedom as the physician deemed appropriate

Tomes explores the ambiguities of these and other dimensions of life under Kirkbride She makes particularly good use of surviving archives in reconstructing two facets of Kirkbride's world. his relationships with members of his staff, on the one hand, and with his patients and their families, on the other. She details the problems of finding domestic and nursing staff, and examines the subsequent careers of a number of the young men (and some not so young) who acted as Kirkbride's assistant physicians She uses the difficulties of one of these, John Curwen, who became superintendent of the Pennsylvania State Lunatic Asylum, as a means of analyzing increasing disaffection with asylums from the late 1850s Much of this disaffection was economic, as politicians argued that asylums were not cost effective, particularly in the "mixed" hospital (part private, part charity) such as Kirkbride's, and a new breed of office-based "neurologists" argued that out-patient care was often more efficient

Kirkbride's correspondence with patients and their families provides Tomes with another archival cache which she exploits well in her analysis of popular ideas of mental disorder and of patient life within the asylum She examines the biographies of three patients in detail, one of whom subsequently became Mrs. Kirkbride, another of whom (Ebenezer Haskell) eventually brought a suit against the hospital, charging wrongful confinement Although Haskell was one of only sixteen patients (out of more than 8,000 admissions) to seek legal redress for wrongs, real or imagined, during Kirkbride's superintendency, cases such as his became highly visible in the world of declining asylum authority of Kirkbride's later years

Tomes makes no attempt to whitewash Kirkbride and his colleagues, or to view the classic asylum through rose-colored spectacles But neither is she prepared to caricature mid-nineteenth-century American psychiatrists as willing stooges of a vaster program of social control. The result is a judicious rehabilitation of Kirkbride, but one which also explores new dimensions of patient life, and of the politics and economics of psychiatric practice in Kirkbride's America

Reviewed by WILLIAM F. BYNUM, Wellcome Institute for the History of Medicine, London, England

YVONNE KNIBIEHLER, VERONIQUE LEROUX-HUGON, ODILE DUPONT-HESSE, and YOLANDE TASTAYRE *Cornettes et blouses blanches: Les infirmières dans la société française (1880–1980).* Paris· Hachette Littérature, 1984 366 pp. F82,00 (paperbound)

Present concerns about the future of nursing in France led the four authors to write this book. They turned to the social history of nursing to seek the identity of the profession and to understand the development of nursing techniques and ideologies which guided the evolution of the profession Given the difficulty of finding good secondary sources and the problem of access to primary sources, the authors relied heavily on interviews in constructing their account.

The authors trace the evolution of nursing from 1880 to 1980, a period in which French nursing was transformed from a caretaking practice to a (mostly) feminine profession During these years several institutions trained and employed most French nurses: the Office of Public Welfare (Assistance publique), the Red Cross, of which there were three separate and rival organizations, and religious congregations, numbering over 200 at the beginning of the twentieth century

The history of French nursing can be divided into three periods. (1) from 1880 to the end of World War I; (2) from the 1920s to the 1960s; and (3) from the 1960s to the present. The first period included the emergence of the nursing profession following the Pasteurian revolution and the institution of the Third Republic's national health campaign, the laicization of much formerly religious activity; the gaining of recognition and esteem by nurses in World War I, the work of the pioneers like Anna Hamilton, the French "Nightingale," the institution of the *diplôme d'Etat* for nursing, and the founding of nursing schools, organizations and journals

The 1920s to the 1960s was a period of stagnation and conservatism in which the full professionalization of nursing was prevented for several reasons. the dispersion of nurses in a variety of institutions; wide disparities in social background, from the lower class Public Welfare nurses to the upper class Red Cross nurses, and an ethic of devotion and abnegation incorporated in nurses' training which prevented professional solidarity and kept nurses subordinate to physicians. As a result of the nurses' failure to achieve full professionalization, nursing education remained mediocre, working conditions were extremely arduous, and there was little prestige attached to the job.

Beginning in the 1960s nursing entered a new era of disputes and demands, many of which are not yet resolved or attained A decline of the self-abnegation and devotion ethic changed the character of the occupation, and an era of recognition of rights finally resulted in the transition of nursing from a caretaking occupation to a medical profession.

Historians of medicine, public health and nursing will find this account extremely informative and compelling. The work falls within the "new social history of nursing" (see Janet Wilson James, "Writing and rewriting nursing history a review essay," *Bull Hist. Med,* 1984, *58*· 568–84) it is a non-celebratory social analysis which tells us who the nurses were, where they came from, what they did and why. The authors place the evolution of nursing within the broader socioeconomic and political framework of the years 1880 to 1980 This book makes an important contribution to the new social history of nursing, and I strongly recommend it

Reviewed by ANN F LA BERGE, Center for the Study of Science in Society, Virginia Polytechnic Institute and State University, Blacksburg.

CLEMENT A. SMITH ***The Children's Hospital of Boston: "Built Better Than They Knew"***. Boston and Toronto: Little, Brown, 1983 ix + 284 pp. Ill $16 95 (paperbound).

Although skeptical about the value of children's hospitals, Florence Nightingale was in no doubt about how youthful patients should be treated "It is not enough to be merely conscientious and patient with sick children There must be a real genuine vocation and love for the work; a feeling as if your own happiness were bound up in each particular child's recovery" Clement Smith's book leaves no doubt that Miss

Nightingale's words reflect the guiding philosophy of the Children's Hospital of Boston since its foundation

Smith's work is a distinguished example of the "in-house" hospital history Love of his subject is apparent on every page, and although this sometimes tempts him into uncritical assessments of the leading figures, medical and lay, who have guided the fortunes of the hospital (especially those known to him personally), the thoroughness of his research demands our admiration Written and oral archive material, primary and secondary sources, are judiciously blended to produce an absorbing and readable survey of more than a century of caring The author also has a fine sense of humor, which is deployed sparingly and to great effect. The reader will find many passages spiced with anecdote or aside.

The weaknesses of the book are those shared by most of this genre. Although he attempts a dispassionate survey, occasionally Smith's guard slips and he betrays the "whiggish" approach to history characteristic of many medical practitioners There are moments in the earlier chapters when one senses an impatience to move on to the era of "scientific" medicine. Once that era is reached in this predominantly chronological account, there is perhaps too much emphasis upon clinicians and their practice. The book would also have profited by a closer relationship to the development of the discipline of pediatrics in general, and in the rest of the United States in particular.

Smith has been well served by his publishers His text is well presented, and the illustrations sensibly placed within it Room has been found for references and a useful index. When the *British Medical Journal* reviewed *Pediatrics* by Thomas Morgan Rotch of this hospital in 1896, the verdict was that the book was "well adapted to meet the wants of practitioners who may not have the opportunity of seeing the practice of a large children's hospital." The same can be said of Smith's work.

Reviewed by JOHN R. GUY, Marsh-Jackson Postgraduate Medical Centre, Yeovil, Somerset, England

ALVIN E RODIN and JACK D KEY ***Medical Casebook of Doctor Arthur Conan Doyle: From Practitioner to Sherlock Holmes and Beyond*** Malabar, Florida. Robert E Krieger, 1984. xxi + 473 pp Ill $28.50

"Never has so much been written by so many for so few." This paraphrase of the epigrammatic Churchill by Christopher Morley, referring to the growing literature about Sherlock Holmes and his creator, is even more true now than when first penned four decades ago Occasionally, however, a new book of Sherlockian/Doylian scholarship makes a substantial contribution to a field in which few stones have been left unturned Rodin and Key have done so in this exhaustive study of the medical life and related writings of Sir Arthur Conan Doyle

This book is divided into three sections. The first deals with Doyle as a medical student and practitioner, the second with Doyle's non-Sherlockian fiction, the third with medical aspects of the Holmes Canon The text is followed by copious section notes, five appendices, and a reference list with 947 bibliographic citations

The first section is at once the most informative and least satisfying The authors afford the reader more information on Doyle's medical life than is revealed in previous biographies. Yet they are at such pains to refute the widely held view that Doyle was an indifferent physician with little success in practice that they leave this reader with the feeling that they protest too much. In this I fault less the authors, who are attempting to argue an innovative point of view, than the editor who could have reduced this repetitive, verbose section by fully one-third, thereby increasing the impact of the authors' arguments.

In discussing the "medical writing" of Doyle, the authors take license with this term by listing and discussing together Doyle's unpublished M.D. (Edin.) thesis, three letters to the editors of *Lancet* and the *British Medical Journal*, and a variety of articles and letters in popular newspapers and magazines. The letters to the medical journals show Doyle to be a good observer and a supporter of careful investigation but hardly support the authors' conclusion that Doyle was an "exceptional medical personage."

Although several previous authors have taken an interest in Doyle's non-Sherlockian fiction, none has evaluated so exhaustively as do Rodin and Key in Section 2 the medical aspects of Doyle's stories and novels. I particularly enjoyed the authors' discussions of the numerous medical analogies to be found in Doyle's fictional works.

The final section deals with the medical aspects of the Sherlock Holmes stories. While other authors have treated of various medical aspects of the Canon, none has done so in both the depth and breadth of the present work. The impact of Doyle's medical background is clearly brought home to the reader; it is likely that the essential nature of these tales would be changed radically by the absence of often intriguing allusions to diseases, drugs, and doctors.

For the medical historian this book offers a few interesting insights into the life of a medical student and practitioner in the 1870s and 1880s. For the Sherlockian enthusiast the book stresses aspects of Doyle's writings which have been little emphasized in the past. The authors are to be commended for a fine piece of investigation and compilation. Subsequent editions of the book would benefit greatly from a firm editorial hand, needed to correct redundancy, verbosity, and distracting errors in grammar, syntax, and spelling.

Reviewed by BRUCE R. PARKER, Department of Radiology, Stanford University, Stanford, California.

ISABEL R. PLESSET. ***Noguchi and His Patrons.*** Cranbury, New Jersey: Fairleigh Dickinson University Press, London and Toronto: Associated University Presses, 1980. 314 pp. Ill. $25.00.

At a memorial service for Hideyo Noguchi in 1928, Theobald Smith, the eminent microbiologist, observed that Noguchi was "one of the greatest, if not the greatest, figure in microbiology, since Pasteur and Koch." Unlike Pasteur and Koch (and even Theobald Smith), however, Noguchi did not retain his claim to pre-eminence. Although he made two enduring contributions to microbiology (the discovery of *Treponema pallidum* in the brains of general paretics in 1913 and the demonstration in 1926–27 that Oroya fever, a severe systemic disease, and verruga peruana, a localized skin affliction, are produced by the same microorganism), Noguchi's other "discoveries" of the causative agents of poliomyelitis, rabies, and trachoma proved unfounded. In the case of yellow fever, Noguchi's insistence that the spirochete *Leptospira icteroides* caused the disease, despite negative reports from other laboratories, led to reliance on an ineffective serum for yellow fever and contributed to

Noguchi's death from the disease in 1928 Isabel R. Plesset examines the extraordinary celebrity Noguchi attained in his lifetime. In addition to biographical material obtained from Noguchi's Japanese correspondents, Plesset utilized the papers of Noguchi's colleagues at the Rockefeller Institute for Medical Research, including those of Simon Flexner, Peyton Rous, and Peter Olitsky She interviewed more than fifty people who knew Noguchi either as a colleague or as a personal friend She also had access to Noguchi's medical records, which revealed an aortic insufficiency resulting from secondary syphilis

Plesset presents a compassionate portrait of Noguchi's erratic scientific gifts and personal charm Citing his physical deformity, his expatriation, and his limited education, Plesset compellingly depicts the intense pressures Noguchi experienced, pressures that help to explain his enormous ambition, personal recklessness, and his arrogance toward his professional colleagues. Her attempt to elucidate the continuing support Noguchi received for his questionable research reports, particularly from some of his colleagues at the Institute, is less successful Noguchi's relationship with Simon Flexner, the scientific director of the Institute, which spanned more than a quarter-century, remains enigmatic It is perhaps unfair to expect the author to explain Flexner's motives in Noguchi's biography Yet Flexner's patronage (Paul De Kruif described Noguchi as the creation and slave of his Svengali, Flexner) is critical to understanding Noguchi's career and the public reception of his work.

Plesset's omission of the considerable antivivisectionist attacks on Noguchi's work in the years 1912–14 is difficult to understand. The luetin test, which Noguchi hoped would supplement the Wassermann test in the serological diagnosis of syphilis, merits only a paragraph. There is no mention of the fact that the New York Society for the Prevention of Cruelty to Children instituted a formal complaint against Noguchi in 1912 on charges of assault for his testing of luetin on orphans Although the District Attorney's Office declined prosecution, this undoubtedly affected Noguchi Yet Plesset omits this.

Despite its shortcomings, *Noguchi and His Patrons* is a vast improvement over the other book-length treatment of Noguchi available in English, Gustav Eckstein's *Noguchi* (New York, 1931) It should also be of interest to those wishing to supplement George W Corner's *A History of the Rockefeller Institute* (New York, 1964)

Reviewed by SUSAN EYRICH LEDERER, Department of the History of Science, University of Wisconsin, Madison, Wisconsin

THEODOR W. ENGELMANN ***Th W. Engelmann: Professor of Physiology, Utrecht (1889–1897). Some Papers and His Bibliography*** (facsimile edition). Introduction by Frits L Meijler and foreword by Dirk Durrer Amsterdam· Rodopi, 1984 xv + 264 pp $32.25 (paperbound) (Distributed in the U S by Humanities Press)

Theodor Wilhelm Engelmann worked at Utrecht from 1867 until 1897, when he succeeded Du Bois-Reymond at Berlin The years at Utrecht were productive ones Engelmann joined others in advocating a myogenic theory for impulse formation and conduction in the heart He used a rheotome to plot the diphasic variation in the electrical potential of the heart, and thus produced an early form of the electrocardiogram. Near the end of his stay, Engelmann used mechanical recording devices to study several varieties of abnormal cardiac rhythms

Engelmann's pioneering work on cardiac arrhythmias stimulated many other investigators, from his pupil Karel Wenckebach to Charles Fisch, Distinguished Professor of Medicine at Indiana University and, like Engelmann, a student of aberrant cardiac conduction The awarding of an honorary Utrecht doctorate to Fisch in 1984 prompted the publication of this collection

The book includes a brief historical introduction, a complete bibliography of Engelmann's 245 works, and facsimile reproductions of ten of his papers, written in Dutch, English, French and German. They were all published between 1893 and 1903, but the basis for their selection from Engelmann's sixty-six publications during that decade is not given. The papers include discussions of the effects of the vagus nerve on the heart, a description of concealed conduction and the compensatory pause, and an example of the use of a laddergram (an innovation frequently incorrectly attributed to Thomas Lewis, who used this method a decade or so later) to analyze a premature atrial beat's effect on the cardiac rhythm The facsimiles are taken from Wenckebach's library, and include a few corrections and annotations that could be useful to scholars interested in the relationship between Wenckebach and Engelmann. The book will be most valuable if it provokes further evaluation of Engelmann's role in pre-electrocardiogram studies of the heartbeat. However, for a collection of articles which, save the annotations, could be found in most major libraries, the price seems a bit steep.

Reviewed by JOEL HOWELL, Department of Medicine, University of Michigan, Ann Arbor, Michigan.

HANS KONRAD ISELIN (ed) ***Zur Entstehung von C. G. Jungs "Psychologischen Typen".*** Aarau-Frankfurt-Salzburg Verlag Sauerlander, 1982 (Veröffentlichung der Schweizerischen Gesellschaft für Geschichte der Medizin und der Naturwissenschaften, no. 38). 152 pp. Sw. Fr. 35,00 (paperbound)

This modest publication of a set of thirteen letters, with accompanying mini-biographies of Carl Gustav Jung (1875–1961) in relation to his younger Swiss friend, Hans Schmid (1881–1932), will fill an important gap in our understanding of the foundations of Jung's thought after he diverged from Freud

Jung had met Freud in 1906, and adopted him as a father figure until 1913, when he resigned from editorship of the *Jahrbuch für psychoanalytische und psychopathologische Forschung.* Then Jung entered a period of creative illness, which ended only at the close of World War I in 1921 with the publication of *Psychologische Typen*

Already in 1913, at the age of thirty-eight, Jung had lectured on dichotomous psychological types. He distinguished between "directed" (*gerichtete*) and "nondirected" (*ungerichtete*) thought, a burning issue in German psychology, e.g., the Leipzig versus the Wurzbürg school; he had related the indirected thought to hysteria and "introversion psychosis," later known as schizophrenia (p 136).

Then came the encounter with Schmid at a conference, and their six-month correspondence from June 1915 to January 1916 Schmid at age thirty-four clearly looked up to Jung, who at forty-one was an established personage The first exchange of letters recognized their respective personalities tending toward "analytic" rational thought (Jung) and feeling, irrational thought (Schmid) In the third letter, Jung explained introversion as accommodation by abstracting from the object; extroversion became an empathizing with the object (p 49) Gradually, however, the two friends came to disagree, and their disagreement broke the friendship As the author notes, their correspondence illuminates the personal origins of theory and it reveals how difficult it was to be a friend of Carl Jung

The theoretical issue dividing them was an offshoot of their introvert and extrovert personalities Using the metaphor of a motor boat for introversion and a sailboat for extroversion, Schmid distinguished two ideals introversion into one's own personality and accommodation to social reality Thus, when the wind fails, the motor boat drives off (introvert), when the gasoline tank is empty, the sailboat pulls (extrovert). However, what if the extrovert does not help the introvert, queried Jung Jung's answer to Schmid is that it is not a question of two persons helping one another, but of creative conflict in the unconscious. "the opposites are supposed to be balanced in the individual himself" (p 56).

It is significant that Jung himself designated these letters as the chief source of the book, *Psychologische Typen* Yet the editor disclaims a final picture of the influences on Jung's book, pointing to the correspondence of both Freud and Jung with Sabina Spielrein for further insight.

Reviewed by WILLIAM R. WOODWARD, Department of Psychology, University of New Hampshire, Durham, New Hampshire

WILLIAM LLOYD FOX. ***Dandy of Johns Hopkins*** Baltimore and London Williams & Wilkins, 1984 (with the sponsorship of the Congress of Neurological Surgeons). xii + 293 pp. Ill $20.00

Almost forty years after his death, a biography of Walter Dandy has been published. To compile this account, the author, W. L Fox, solicited the help of many people who had known Dandy or who had been inspired by his contributions to surgery of the nervous system. Accordingly, this is a distillate of events and legends that surround the career of a superb surgeon who explored uncharted regions of the brain.

After a brief introduction to the development of brain surgery in the nineteenth century, Fox describes the childhood and medical education of Dandy at the Johns Hopkins Medical School in the early part of this century. That was the era of the Big Four at Hopkins. Dandy, attracted to surgery, was accepted in the surgical training program after graduating He was assigned to the service of Harvey Cushing who was in charge of the Hunterian Laboratory where experimental animal work was being done. Cushing, however, was busy with his clinical practice and with preparations to assume his new chair of surgery at Harvard University So, Dandy was given an experimental project to confirm one of Cushing's theories But the project did not turn out as Cushing had anticipated, and Dandy, left to his own devices, teamed up with Blackfan, another trainee in pediatrics, to study hydrocephalus When Cushing heard of their experimental work he wanted to continue it at Harvard but Dandy refused to give him their preliminary results Cushing ceded, but later Dandy, who was expecting to accompany Cushing to Harvard, was informed that he would not receive the appointment

When Cushing left, Dandy took over the neurosurgical service and the privilege of private practice. He completed his studies of obstructive and communicating hydrocephalus with Blackfan in a few years and then explored means of visualizing the ventricular system By 1918, he had demonstrated that the ventricles could be seen, if the ventricular fluid was replaced by air, in roentgenograms of the skull This diagnostic technique, considered by some to be Dandy's greatest contribution to neurosurgery, was not accepted by Cushing, who considered the procedure too dangerous. The gulf between the two men widened Perhaps this was a factor in Dandy's refusal to join "Cushing's Neurosurgical Club" as he dubbed the Society of Neurological Surgeons at the time of its formation in 1921 The ultimate episode in the feud occurred a few months later when Dandy published a brief report advocating total extirpation of acoustic nerve tumors without making reference to Cushing's monograph of 1916 on the subject In this treatise, Cushing had concluded that intracapsular enucleation was the only safe method of treatment. In response, Cushing, in a letter to the Editor of the *Bulletin of the Johns Hopkins Hospital,* asked for details of mortality and morbidity, implying that the procedure was unnecessarily risky Fox, in discussing this feud, agrees with previous writers that Cushing's reproach was unwarranted. The incident worsened the already weakened ties between the two men who, thereafter, had only a casual relationship.

Dandy was at his best in the operating room. His equipment was relatively simple A headlight of his own design illuminated his operative field in a darkened room. Instead of the silver clips which Cushing preferred for controlling bleeding, Dandy used an electrosurgical unit. He was not adverse to removing a tumor by finger dissection and packing the cavity with cottonoid to stop the bleeding. He was able to manipulate this simple armamentarium dextrously and skilfully to effect any desired section or resection It must be admitted that Dandy was most proficient when working in a normal anatomical field, such as the cerebello-pontine angle for section of the fifth cranial nerve root, and less at ease with a space-occupying lesion

Fox recognizes Dandy's originality, pointing out that he devised operations for the relief of tic douloureux, glossopharyngeal neuralgia and Ménière's disease However, the primacy of some other procedures, such as lumbar intervertebral discectomy, which Fox attributes to Dandy, might be questioned

The book contains a gallery of interesting photographs of Dandy's life and a bibliography of his writings A compilation of his operative experiences at Hopkins and a few examples of his surgical notes are appended

In the concluding chapter an attempt is made to summarize Dandy's impact on the developing specialty of brain surgery. The book, written by a historian, emphasizes the aspects of Dandy's career that laymen should find interesting. A surgical associate might have provided more details of Dandy's successes and failures in the operating room—an account which would have appealed to the medical profession. Yet, this story of the struggles of a surgeon who explored novel means of operating upon the brain should be particularly inspiring to younger neurosurgeons who work with equipment and under conditions vastly superior to those available to Dandy The book is a worthy tribute to a brain surgeon who devised new and better ways of relieving the afflictions of man's master organ

Reviewed by **A. EARL WALKER**, Department of Surgery/Neurosurgery, University of New Mexico School of Medicine, Albuquerque

BARBARA SICHERMAN *Alice Hamilton: A Life in Letters.* Cambridge, Massachusetts and London Harvard University Press, 1984 (A Commonwealth Fund Book) x + 460 pp. $25.00

Industrial hazards to workers, even to entire communities, have once again captured public interest. Love Canal or Bhopal would have been sad, but hardly startling, news to a struggling band of reformers who worked tirelessly in the early decades of this century to bring such conditions to public awareness and to the attention of their fellow physicians From the conditions under which miners were forced to work in the sixteenth century, written about by Paracelsus and Agricola, to the vicissitudes of OSHA, an American governmental agency that has been charged with minimizing today's industrial hazards, the story of occupational medicine deserves far more attention than it has received Even the classic work of Ramazzini, available as a paperback reprint just a few years ago, is now hard to find in bookstores.

Even though an undue emphasis on the great names and ideas of medicine has been out of fashion in recent years, most of us still have our heroes and heroines. Few have been higher on my list than Alice Hamilton The more I read by and about Alice Hamilton the more I wanted to learn about her work Her autobiography, *Exploring the Dangerous Trades* (1943) is interesting, but it was quite obviously written by an intensely private and extremely modest person We have now, thanks to Barbara Sicherman, one of the most fulfilling books about the life and work of a physician that I have read in many a year. She has deftly probed into the person that was Alice Hamilton by using her letters to close friends and family members and by interspersing these with excellent annotations and vivid descriptions of the pertinent events in Alice Hamilton's long and productive life The book, as Sicherman notes, is a work of two voices, Alice Hamilton's and her own

Alice Hamilton was a member of a large and close family in Fort Wayne, Indiana. Several of her cousins and sisters never married, so they remained close throughout their very long lives, and they wrote lengthy and interesting letters. Alice Hamilton went to medical school in Ann Arbor in 1893, lived for years in Jane Addams's Hull House in Chicago, and was the first woman appointed to a regular Harvard faculty position in 1919

She was best known for her work on industrial toxicology Her 1925 book, *Industrial Poisons in the United States,* was the first of its kind in this country She corresponded regularly with her family, with co-workers such as Jane Addams, and with friends such as Felix Frankfurter She died in 1970 at the age of 101 As Sicherman notes, three months later Congress passed the Occupational Health and Safety Act.

The 132 letters and the copious biographical and explanatory materials interspersed between them have resulted in a beautiful piece of scholarship and a book that is a pleasure to read and to think about

Reviewed by GERT H BRIEGER, Institute of the History of Medicine, The Johns Hopkins University, Baltimore, Maryland.

HELEN CLAPESATTLE *Dr. Webb of Colorado Springs* Boulder· Colorado Associated University Press, 1984 xi + 507 pp. Ill. $19 50

When Gerald Webb (1871–1948) arrived in the United States in December 1894 with his tuberculous American-born wife, he was twenty-three years old and the holder of a licentiate in dentistry from Guy's Hospital, where he had also devoted an additional year to the study of medicine and surgery He came to Colorado in the summer of 1895, entered as a final-year medical student (the youngest in his class of eleven) at the University of Denver that autumn, graduated with his M.D. in April 1896, and was established in general practice in Colorado Springs by the end of that year By the turn of the century he was boasting to his family in England that he had the biggest and best practice in town, with an income in good years of about $15,000. In 1906 he was in London for several months at the laboratory of Sir Almroth Wright, then working up his notion of the "opsonic index," and later visited clinics in Vienna. Returning to his practice in Colorado Springs, he adopted autogenous vaccine therapy for almost routine use, operated a clinical laboratory for the medical community, and became recognized as a clinician and tuberculosis specialist, with patients of prominence referred from the East and Midwest. He was closely associated with Cragmor Sanatorium from its beginning; after observing many passing therapeutic fads and fancies he would wind up with a belief only in the efficacy of rest in the open air.

Webb was a founder of the American Association of Immunologists (1913) and was a member of the National Tuberculosis Association, the Association of American Physicians, and the American Clinical and Climatological Association, all of which he served as President at one time or another He contributed a chapter on "Specific Therapeutics of Mixed and Concomitant Infections" to the treatise on *Tuberculosis* edited by Arnold Klebs (1909) In 1916 he became an associate editor of the *Journal of Laboratory and Clinical Medicine,* in 1918 he was in France with the American Expeditionary Forces as Senior Tuberculosis Consultant He brought out his *Laennec: A Memoir* in 1928, his *Tuberculosis* appeared in the *Clio Medica* series in 1936; and his biography of Henry Sewall (1855–1936) was published in 1946. He was the author of the sections on general treatment of tuberculosis in the 1930s editions of the Cecil *Textbook.* In 1924 he founded the Colorado Foundation for Research in Tuberculosis, in Colorado Springs, it is now the Webb-Waring Lung Institute, at the University of Colorado in Denver.

Gerald Webb was a well-read, well-traveled, cosmopolitan physician, much admired and much loved by patients and by colleagues, a bibliophile, a book collector, a good pianist and amateur Savoyard, a bird-watcher and a crack tennis- and polo-player who was capable of producing a paper on the "Evolution and Extinction of the Horse in America." Clapesattle, best known for her book, *The Doctors Mayo,* has told this fascinating story well; it does come off a little better as social history than it does as the history of medical developments, although dozens of eminent medical people parade through her pages. She has relied on thousands of Webb's letters, written to patients and to family members and daily to his wife from great cities at home and abroad, and the book takes on a somewhat chatty tone because of this While she narrates events in chronological order, it is still often difficult to distinguish the month-and-year timing of various episodes, as precise dates are given only at widening intervals. Specific documentation of sources is minimal, almost non-existent, and it is particularly lamentable that a bibliography of Webb's writings is not included, even though the author says she has compiled a list of 146 papers and books that Webb wrote The book has a good index of seventeen pages, and there one can note with some astonishment the names of practically everybody from Clara Barton to Vincent Youmans

Reviewed by **FRANK BRADWAY ROGERS**, Denver, Colorado.

BENJAMIN A. WHITE *Stanley Cobb: A Builder of the Modern Neurosciences.* Boston: Francis A. Countway Library of Medicine, 1984 xv + 445 pp $29 50 (Distributed by the University Press of Virginia)

"Why," queries the Preface, "write a book about Stanley Cobb?" Scarcely fifteen years have passed since his death in 1968, and he is "an almost forgotten figure," little known to the medical profession outside of his specialty of neurology Yet, insists the author, such a fate does not befit this versatile architect of twentieth-century neuroscience, a point he argues favorably in the more than 400 pages which follow.

It is not difficult to explain Cobb's relative obscurity. He transformed medicine by no miraculous discovery, although electroencephalography and the anti-epileptic drug Dilantin were his foster children He pioneered no neurologic therapy or psychoanalytic school, even though he preached the tenets of psychosomatic medicine before they became orthodoxy. No syndrome or disease bears his eponym, that modern day equivalent of immortality

Nonetheless, the life of Stanley Cobb was impressively varied and productive His fertile mind turned first—and later returned—to ornithology Thus primed by the wonder of Nature, he spent most of his professional career in the burgeoning arena of neuropsychiatry. The author of more than 500 scientific papers, investigator, clinician, teacher, and laboratory director, Cobb gave unique expression to his manifold abilities and interests in establishing the neurological unit at Boston City Hospital. Somewhat later in his career, Cobb, not unlike James Jackson Putnam, another eminent Bostonian neurologist who turned to psychiatry, helped legitimize psychoanalytic psychiatry in the hospital and world of academic medicine.

Indeed, Cobb's eclectic approach to the neurosciences constitutes one of his chief contributions Trained first in the exacting European tradition of neuroanatomy, Cobb then went "the whole route" from practicing clinical neurology to espousing the validity of Freudian psychoanalysis In so doing, Cobb, like Putnam before him, lost his reverence for the conventional distinction between "organic" and "functional" nervous disorders, a heresy undoubtedly facilitated by his own lifelong struggle with stuttering

But if Cobb's broad concept of the nervous system and his synthetic approach—exemplified in the Boston City Hospital neurological unit—to investigating and understanding it were among his major achievements, they were complemented by the equally important gift of inspiring his students and co-workers to perform to capacity As a colleague remarked, Cobb had, in addition to his other accomplishments, "the unique faculty of finding and bringing out the best in those associated with him." Thus did Cobb combine both Muse and Method.

The craftsman of this intriguing narration is Cobb's son-in-law, one of the legion of physicians who benefited from his neuroscientific inspiration In what began as a modest family history, White has elaborated, with the skillful use of oral sources, the tale and taught the value of a "modern Renaissance medical man " We are indebted to the author for illuminating this figure, whose model and memory shine the more brightly for his efforts There can be no clearer answer to the question posed in the Preface than that found on the pages of this book.

Reviewed by STEPHEN Y. WILKERSON, Department of Pathology, Ireland Army Hospital, Fort Knox, Kentucky.

THEODORE R. MARMOR *Political Analysis and American Medical Care: Essays.* Cambridge and New York Cambridge University Press, 1983 xix + 268 pp $34 50 (cloth), $12 95 (paperbound).

Theodore R. Marmor is a historian who uses the methods and literary forms of political science, policy analysis and political advocacy He first commanded our attention with what is still the definitive study of *The Politics of Medicare* (Chicago Aldine, 1973). In this collection of fifteen essays written during the second half of the 1970s, Marmor addresses three subjects· the pertinence of the theories and methods of political science for comprehending health politics and policy, the politics of health affairs in the United States and abroad in recent decades; and the recent history of national health insurance as it was proposed in the United States and implemented in Canada These essays are contributions to historiography, to the understanding of recent events in health affairs, and to the continuing controversy about the utility of historical studies

Marmor addresses several important methodological issues. He describes the difficulties and opportunities of cross-national research (pp 45–57), and dissects the failure of historians and political scientists to use comparative analysis to test hypotheses about the uniqueness of national political cultures (pp 107–30) He also criticizes implicit evaluations of the past—the historicist fallacy that data should be arrayed to demonstrate "what social programs should be like" (p. 158).

Because Marmor is both a scholar and an activist, he poses controversial questions about the purposes of historical research He insists that his goal as a scholar is "understanding not prescribing" (p. xii) Unlike most historians, however, he also uses historical evidence to assess the "probable effects" of proposed policies (p 46) His most arresting methodological innovation is using Canada as a natural experiment on the basis of which he conjectures about the effects of various proposals for national health insurance in the United States But Marmor carefully separates historical analysis from the prospective evaluation of policy. He does not distort data for polemical purposes Moreover, he carefully distinguishes both analysis and assessment from his advocacy of particular policies.

Marmor's decision, early in his career, to abandon the conventions of historical writing, has enlarged his audience, but not without some cost. Because he is not required to array pertinent historical evidence each time he addresses an issue, he occasionally and unaccountably neglects sources which bear on his analysis, and with which, as he reveals in other essays, he is familiar. In his essay on consumer representation in health planning, for example, he chose to ignore the effects of the citizen participation policies of the 1960s on events in the next decade Much more important, Marmor's essays about national health insurance in the United States are already dated The scholarly basis of these essays is overwhelmed by their purpose, which was to influence debates about policy in the Carter Administration Marmor's importance in contemporary history and political science would be more readily apparent if he would write the book about the politics of health policy in Europe and the United States during the past generation which he so brilliantly foreshadows in these essays

Reviewed by **DANIEL M. FOX**, Health Sciences Center, School of Medicine, State University of New York at Stony Brook, Stony Brook, New York

FRANK D. CAMPION. *The AMA and U.S. Health Policy Since 1940.* Chicago Chicago Review Press for the AMA, 1984. ix + 603 pp. $25.00

The American Medical Association has published at last its first official history, but one confined largely to the era since about the beginning of World War II. Frank D. Campion, a long-time member of the staff of the AMA, and a former editor of *Life,* has designed a book for easy reading by one "with virtually no knowledge of medicine, the AMA, or United States health policy." He assures wary readers that neither his position with the AMA nor his sponsorship by its Board of Trustees has altered this work which would "very likely" be the same production if he had written it independently.

This book is less significant as a history of the AMA and national health policy than as a work reflecting how probably most physicians, fairly familiar with both, look upon them. It is no different from other books of comparable origin in combining peculiar strengths and weaknesses. Its principal merits include Campion's substantial reliance on oral taped interviews which he conducted with more than sixty officials of the AMA and affiliated organizations who were principals in the events he narrates. Particularly impressive is the broad scope of his treatment and his depiction of the new scientific world of medicine challenging the AMA by mid-century. His portrayal of the structure of the AMA, the operations of a professional bureaucracy with all of its strains and frictions, and the formulation and implementation of policies on public issues is generally adequate. Furthermore, he writes with refreshing candor about such matters as the AMA's opposition to voluntary health insurance, which some prominent officials of the organization once denied.

Campion's support for his thesis that in the last two decades a new American Medical Association has emerged from the old comes partially from his analysis of the evolution of headquarters leadership. As he has it, Morris Fishbein, editor of the *Journal of the American Medical Association* in the 1940s, dominated the AMA before his enforced retirement in 1949. Then for more than a decade leaders remained largely "crusaders" who projected much of the Fishbein spirit of truculence and inflexibility. After the passage of Medicare in 1965, Campion contends that leadership fell to "pragmatists" among whom was the executive vice president, Ernest B. Howard, followed after a decade by James H. Sammons. The crusaders and pragmatists shared basically the same views but the latter differed from the former in style and in an appreciation of the political necessities for concession and compromise. Clearly the victors of internecine conflict emerge as the heroes in this epic but these leaders, the author might have noted, were produced in part by the federal government that tempered their actions increasingly by the chastening threat of federal antitrust suits and court injunctions.

Moving to Part III, which the author calls the "essential element" of the book, his objectivity diminishes as he relies largely on AMA records and ignores vast resources needed for his study. At times he drops the role of historian to assume that of editor-journalist. A few examples must suffice. He declines to provide a balanced sampling of materials the Association developed for its propaganda offensive against Truman's national health insurance plan in 1948, asserting instead that the Association's excursion in "overkill" did not exceed the bounds of "acceptable political hyperbole." He omits the deceptive strategy that *JAMA* employed against its own readers near mid-century to discredit the British National Health Service, a strategy that a spokesman for the British Medical Association denounced and deplored

Campion goes far toward explaining away the AMA's obstructions to the development of adequate physician resources in its attack on forces that correctly anticipated the great shortage by 1960 and prepared to meet it. He does not reveal that Frank G Dickinson, director of the AMA's Bureau of Medical Economic Research prophesied a "probable" physician *surplus* by 1960 He apparently made no effort to find out whether *specific* medical schools established after mid-century came with or without the support of the medical establishment, state or national, or over its opposition. He moves lightly over the calamitous crisis in medical care subsequently developing as scarcely more than an inevitable event in the course of progress The Forand bill is hardly more than a political ploy and the author makes little effort to explain the lamentable Kerr-Mills bill fiasco with its state implementations that brought a meager measure of "pauper's oath" medical care for the aged

Although this book falls much below the imperatives of historical scholarship, it makes an important contribution to medical literature Health professionals will gain helpful insights into many facets of the AMA's activities Unfortunately, it may mislead many "with virtually no knowledge of medicine, the AMA, or United States health policy"

Reviewed by JAMES G. BURROW, Department of History, Abilene Christian University, Abilene, Texas.

STEPHEN J KUNITZ. ***Disease Change and the Role of Medicine: The Navajo Experience.*** Berkeley–Los Angeles–London University of California Press, 1983 (Comparative Studies of Health Systems and Medical Care) x + 227 pp Ill. $29.95

This thoughtful book is the latest in a series of comparative studies of health systems and medical care. The author spent several years in the 1960s on the Navajo Reservation, home of the largest tribe of Native Americans, as a public health physician and researcher.

In his introduction, Kunitz says· "the argument I shall present in this book is that among Navajo Indians, an indisputably poor population in a generally wealthy society, medical therapy was of enormous value in treating some of the most important infectious diseases but is and will continue to be of questionable value in reducing mortality from the causes that are now of major significance—accidental and other violent deaths If this is so, then it is important to ask, what role modern medicine does play? The answer, I suggest, is that increasingly medicine acts as an acculturating agent, teaching people to define conditions that are largely psychosocial in origin and rooted in traditional patterns of ecological adaptation and social organization as diseases for which new modes of explanation, treatment and behavior are necessary" (pp. 3–4)

The result of his work among the Navajos and his research is a good example of the advantages of adding knowledge from the social sciences, especially anthropology, to medical knowledge when dealing with health and illness in a different culture. In this case there was more information available concerning Navajo culture than concerning their diseases, due in large part to the absence of detailed medical records and reports from the early days until 1955, when the U.S Public Health Service took charge of Indian medical work.

The first three chapters lay the groundwork, comparing the Navajo to other Indian tribes in birth and death rates, causes of death, educational levels, and income. This is followed by an account of economic and demographic changes, and ends with the current disease patterns on the Reservation Kunitz concludes that the category "social pathologies" (including accidents, alcoholism, stress, violence, suicide, and homicide) is currently the biggest health problem.

There follows a lucid description of Navajo health beliefs and practices by Jerrold Levy, and an account of the many changes in Reservation health care utilization over time, with some of the reasons for these changes.

The last chapter is a summary and discussion of what has gone before Kunitz thinks it unlikely that we can expect continuing future success in control of diseases such as has occurred in the past The growing concept of disease among both Navajos and whites seems to me to "encompass all manner of human distress " This presents a challenge for thinking differently about the disease-state and imagining means of prevention and treatment not yet available.

Reviewed by DOROTHEA C. LEIGHTON, Department of Epidemiology and International Health (Medical Anthropology), University of California at San Francisco.

LEONARD ZUSNE *Biographical Dictionary of Psychology.* Westport, Connecticut. Greenwood Press, 1984. xxi + 563 pp $49 95.

This is an updated and enlarged edition of a dictionary published as *Names in the History of Psychology* in 1975, aimed at practicing psychologists by a psychologist. As such, it will be of interest and value, bringing together scattered material into one volume But its production within this social location involves certain assumptions and consequences which are not made explicit. Zusne's decision to include a biographical entry for a particular figure is based on an exercise in rank-ordering by psychologists themselves, along with his own assessment of significance judged by the space given to a figure in sixteen histories of psychology (histories which often repeat each other). Leaving aside the extraordinary preoccupation of psychologists with rank-ordering themselves, the selection procedure obviously builds on highly structured evaluations (sometimes called "presentism") and discourages any reassessment of historical significance "Psychology" is read back as if it were an eternally present category of human activity, making the present profession the heir of Heraclitus, Aquinas and Montaigne (but why not Homer, Jesus or Rabelais?). While biographical material on all these great people is of course readily available elsewhere, I think the disturbing feature is that the selection procedure and the entries from periods before "psychology" had any identity as a discipline reinforces historical clichés, confirming a highly questionable version of the historical past.

There are about 600 entries, including the recently deceased, arranged alphabetically, each entry includes basic information on dates, career, and biographical sources, along with "the main points of theoretical contributions, philosophies held; inventions and discoveries made; methodologies initiated; books and seminal articles written, research conducted; laboratories, journals and institutions founded, and influence exercised" (Preface, p 2) Zusne has painstakingly gathered his information, mainly from biographies, obituaries, general reference works, and psychological and academic journals Unfortunately, this sometimes produces only a partial picture and misses important recent work Some illustrations: Pinel did not remove chains from patients, and the entry has no reference to Dora Weiner's work, students studied under Pearson in London not Cambridge, and there is an important recent study of his statistical work by Donald Mackenzie, Le Bon's work is discussed at length by Robert Nye, who shows that, far from being linked, Durkheim and Le Bon felt the deepest political and intellectual antipathy, Freud was given a professorship at the University of Vienna, many of his contemporaries were embroiled with ideas of a sexual drive in children, and surely Ellenberger's work on Freud's biography should be mentioned; should we really view Helvétius as an early dynamic psychologist rather than a figure of the post-Lockean Enlightenment? By contrast, the *Dictionary* is at its best and most useful for twentieth-century psychologists when the discipline is clearly constituted. There is a useful appendix listing contributors by institutional affiliation, and an index

Reviewed by ROGER SMITH, Department of History, University of Lancaster, Lancaster, England

TERRY CLIFFORD *Tibetan Buddhist Medicine and Psychiatry: The Diamond Healing.* Foreword by His Holiness the Dalai Lama. Introduction by Lokosh Chandra York Beach, Maine. Samuel Weiser, 1984 xx + 268 pp. Ill. $15.95

ELISABETH FINCKH ***Foundations of Tibetan Medicine According to the Book "r Gyud Bzhi"***, vol 2 Foreword by His Holiness the Dalai Lama. London. Robinson Books, 1985. 131 pp £18.00

FERNAND MEYER. ***GSO-BA RIG-PA: Le système médical tibétain.*** Paris: Editions du CNRS, 1983 237 pp Ill F130,00

For many years, the history and current practice of Tibetan medicine and psychiatry have been neglected by medical historians, if not entirely ignored The reason for this omission is the inability of most Westerners to understand the oral and written wisdom of Tibetans The documentation of Tibetan medicine is scarce and is, in fact, concentrated in a collection of anatomical, physiological and pharmacological scrolls composed in the thirteenth century which originated in Tibetan Lama temples and which served as teaching materials for the Buddhist monks who were studying to become physicians These Lama temples have been rigidly closed to Western visitors Through a lucky accident, however, thirteen of these scrolls found their way into the United States and are now displayed in two of the leading museums of natural history, and in one or two of the important university libraries. They serve as the only reliable source material for the study of Tibetan medicine All of the three books which are here reviewed are based upon these extraordinarily interesting as well as beautiful scrolls. In addition, the authors derived certain insights from their conversations with Tibetan informants, most of whom were members of the Tibetan refugee community in India

The three authors are exceptionally well qualified for the studies they have undertaken The author of the work in French, Fernand Meyer, is said to be "the only scholar" who is "triply qualified" for this study He is thoroughly trained in scientific medicine and practices internal medicine. He is familiar with spoken and literary Tibetan, and finally, he is a thorough observer of Tibet and the Tibetan settlements in India. The same can be said of Elisabeth Finckh who is so familiar with Tibetan medicine in its current form that she adopted Tibetan medicine in her private practice with considerable success. Both Finckh's book and that of Terry Clifford are graced by prefaces from the pen of His Holiness, the Dalai Lama.

The scrolls, text, and illustrations portray an interesting blend of Ayurvedic as well as Arabic medicine. Owing to the long lasting political involvements of China and Tibet, Tibetan medicine contains many traces of Chinese medical practices, such as acupuncture, moxibustion, and pharmacology. All of these elements of Asian medical thinking were combined approximately a thousand years ago in one treatise, entitled *r Gyud Bzhi,* also often referred to in the West as *The Four Roots,* which is the oldest, and still today, the most important of all Tibetan medical books. From unknown Sanskrit documents it was translated into Tibetan in approximately the eighth century A.D. In the process of translation the Lamas added their commentaries, which make it evident what an important role healing plays in the Buddhist religion and how essential a figure the Buddha of Healing is in Tibetan theocracy.

Apart from being in different languages, the three books here reviewed are essentially similar as they are all based on translations of the same source material and on visits to present day Tibetan settlements to observe medical practice. Perhaps the major difference is Clifford's emphasis upon the psychiatric elements in Buddhism whose predominant feature is to prevent and cure suffering. ***Dharma,*** the Buddha's basic principle, teaches one "to tame the mind and transmute the negative emotions. The Buddha taught that mind is the basis of all phenomena. Mind creates matter and mind creates illness and wellness" (Clifford, p. 5). Each of the books serves to fill a long felt lacuna in the literature of Asian medicine. Depending on the reader's preference for French or English, all of them can be recommended most highly. It should be noted that Fernand Meyer's volume contains the richest selection of historical illustrations, and Elisabeth Finckh speaks not only about theory but from her own extensive practical experience.

Reviewed by ILZA VEITH, Departments of History of Health Sciences and Psychiatry, University of California at San Francisco, California

WILLIAM F. MAY. ***The Physician's Covenant: Images of the Healer in Medical Ethics.***
Philadelphia: Westminster Press, 1983. 204 pp. $10.95 (paperbound).

For well over a decade William F. May has been offering fresh insights into the relationship between patients and physicians from the perspective of religious ethics, insights drawn together in this important study of images of the healer in medical ethics.

Professional preoccupations, if unchallenged, tend toward a heedlessness about goals. The constructive purpose of moral reflection in professional settings "entails a knowledgeable re-visioning of foundations and ends" (p. 15). Imagery is particularly well-suited to this task. Images give outward and visible form to human being and vivify human action. They provide "an interpretation . . . that makes moral behavior seem more like a rite repeated than a puzzle solved" (p. 20) Certain images are both reflexive and formative. They show us how we are and shape us for the future.

May examines prominent images of the healer and finds them wanting. There is the image of parent which still exerts potent influence on medical interactions The chief moral marks of parenting are self-expenditure and compassion Unchecked, these otherwise desirable attributes may become overreaching. Parentalism (as paternalism) in modern medicine has been roundly and justly criticized on these very grounds. But, May wisely reminds us, the parent image "still signals the need for a compassionate, sometimes sacrificial, authoritative, and nurturant devotion to another's good" (p 62)

Two additional images of the contemporary healer are analyzed by the author, those of fighter and technician. Because we moderns are so anxious about death and so certain that it is absolutely evil, it should not be surprising that our medical care has taken the form of a campaign against death and that physicians have become partisans in the resistance to death Furthermore, in view of the array of armaments available, it was predictable that technical prowess in their use would come to be prized by the fighters. "Fighter" and "technician" are graven images in that they distort our understanding of healing by downplaying the relationship between patient and physician and by reducing the patient's person to mere battleground

By what authority does May make such a judgment? By the authority of a counter-image, that of covenant, which is the controlling image of the book. It is here that the author's avowed theological perspective becomes explicit The covenant ethic derives principally from the great religious traditions of the West. The defining features of this ethic are gift, promise, and fidelity Covenants originate in an exchange of gifts This exchange implies a promise, fidelity to which sustains the covenant—"... responsiveness to gift characterizes a covenant" (p. 110)

Although it is not entirely clear how the considerable power of images can be legitimately constrained (by the countervailing power of other images, May answers, I think, inadequately), the desirability of founding the doctor-patient relationship on generosity and fidelity is beyond doubt. The covenant image encourages a supererogatory spirit befitting a relationship devoted to the care of the sick.

May's discerning use of imagery as a medium of moral reflection is most welcome, indeed necessary, at a time when medical ethics discourse is sated with principles and rules.

Reviewed by RONALD A. CARSON, Institute for the Medical Humanities, University of Texas Medical Branch, Galveston, Texas.

CARLETON B CHAPMAN. ***Physicians, Law and Ethics.*** New York and London. New York University Press, 1984. xviii + 192 pp Ill. $25.00 (cloth), $10.00 (paperbound). (Distributed by Columbia University Press)

Chapman is former Dean of Dartmouth's medical school, President of the Commonwealth Fund and now professor of history and philosophy of medicine at the Albert Einstein College of Medicine. He opens this book with the astonishing thesis that today, "after centuries of temporizing and rationalizing, the medical profession now seeks to become ethical in the fullest sense of the word." In seven short and tightly written chapters, he describes the "temporizing and rationalizing" by relating the very sketchy allusions to an ethics throughout the history of medicine and the very slow evolution of an effective concept of malpractice He proposes that medicine's ethic and even the law that is created to discipline it are, in reality, means to self promotion and protection. The search to become ethical in the fullest sense is the contemporary turn toward patient autonomy and patient benefit

Chapman's historical excursus is very sketchy but informative Many readers will be surprised by his critique of the Hippocratic ethic, but he merely repeats the now common opinion of scholars The chapters on the development of the Royal College of Physicians and malpractice law in England are most interesting. He omits any discussion of the influence of the Christian ethic on medical ethics, which scholars are now beginning to explore as the source of an altruistic duty in medicine. Mention of this would have made his recital of medicine's lack of a true ethic somewhat less dismal

Chapman's words "ethics in the fullest sense" reveal a major weakness in his book He never quite attains a clear definition of what it is that ethics "in the fullest sense" consists. He does strive to separate it from law as a source of higher and nobler obligation, but fails to provide any substantive notion.

While historians and philosophers may cavil at points in this little volume, it will appeal to many practitioners who are now inclined to reflect on the history of their profession and the nature of its dedication

Reviewed by ALBERT R. JONSEN, Division of Medical Ethics, School of Medicine, University of California, San Francisco.

WILLIAM LEFANU (comp) ***A Bibliography of Edward Jenner*** (2nd edition) Winchester, Hampshire, England: St. Paul's Bibliographies, 1985 xvi + 160 pp Ill. £24.00.

The first edition of William LeFanu's *Bio-Bibliography* has been a valuable aid to those interested in Edward Jenner for thirty-five years. Booksellers sometimes quote "LeFanu numbers" as an inducement to buy Jenneriana Another item may be quoted as "not listed by LeFanu" as though it is rare and valuable. Consequently it might be worth considering the rationale of LeFanu's numbering. He catalogues only Jenner's writings, not works on Jenner or smallpox vaccination unless they contain material written by him; of letters only those written for publication are included Thus Baron and Saunders are catalogued, because they contain material written by Jenner, as are compilations and recent facsimiles. A "LeFanu number," therefore, simply indicates what Jenner material is available and in what form

For those unfamiliar with the 1951 edition the author was, until his retirement, Librarian of the Royal College of Surgeons of England. The volume under review contains a brief but expert account of Jenner's manuscripts and publications in their various English and foreign editions and compilations Brief biographical details are provided and Jenner's conclusions and their reception are summarized and reviewed in the light of later developments. The arrangement is essentially chronological with major chapters on Jenner's early work (including the cuckoo and angina) the ***Inquiry*** (thirty-four versions), other vaccination works, his notebooks, and miscellaneous works including poetry. Listed but not awarded "LeFanu numbers" are thirty-two biographies by Jenner's contemporaries, forty-seven works dedicated to him, and fourteen portraits taken from life Throughout, references are made to modern sources of information and analysis This volume can be heartily recommended to anyone interested in Jenner.

The large format and spacious lay-out of the first edition has been lost, resulting in a less impressive item which, however, fits more easily into bookcase and briefcase A subtle title alteration acknowledges that the brief biographical information does little more than set the scene. The relegation of "footnotes" to the end of the book, with no indication in the text that they are present is inconvenient The first edition catalogued 142 items (including seven by Jenner's nephews). This edition has 174 excluding the nephews, who are properly relegated In general the additions extend the list of foreign editions and modern reprints of the major works, and this will help scholars gain greater access to Jenner's work No major discoveries have been made and LeFanu acknowledges the additions as minor, this should be seen as a tribute to his original scholarship and hard work rather than criticism of the new edition. Only ten illustrations are provided compared to the original twenty-eight Those lost include Jenner's famous letter to Gardner and the American issue of *Instructions* In recompense we have a nice frontispiece portrait by Read and the first side of the 1821 *Circular* letter.

Unfortunately, perhaps to save space, LeFanu omits the list of "almost seven hundred" letters present in the first edition and suggests that they and others located since would be better catalogued by a library computer. Possibly, but those needing information on these letters, some of them very important, still have to rely on the first edition which is thus complemented rather than replaced by the present volume

Finally a "business" matter A second edition was needed if only because the first is so rare But why a limited edition of only 500? Surely even in these parlous times that number will be sold quickly This leaves next year's Jennerians waiting for the occasional second-hand copy to appear at an inflated price—as has been the case for so long with the first edition. All the more reason to snap up a copy of this edition, something no one interested in Jenner can afford to be without

Reviewed by **DERRICK BAXBY**, Department of Medical Microbiology, University of Liverpool, Liverpool, England, U K

THE BULLETIN RECENTLY RECEIVED*

America. History and Life (Part D, Annual Index, vol 21, 1984) Santa Barbara, Calif.: ABC-Clio, 1985. 529 pp (paperbound)

Odin W Anderson *The American Health Services· A Growth Enterprise Since 1875.* Ann Arbor, Mich : Health Administration Press; University of Michigan, 1985 xv + 293 pp. $29.00

Arnaldi de Villanova *Opera medica omnia, XVI Translatio libri Galieni de rigore et tremore et iectigatione et spasmo.* Edited with an English commentary by Michael R. McVaugh Barcelona· Publicacions i Edicions de la Universitat de Barcelona, 1981 (Seminarium historiae medicae granatense, Universidad de Granada). 111 pp. $20.00 (paperbound)

Arnaldi de Villanova. *Opera medica omnia, XV. Commentum supra tractatum Galieni de malicia complexionis diverse* Edited with a Spanish commentary by Luis García Ballester and Eustaquio Sanchez Salor. *Doctrina Galieni de interioribus* Edited with an English commentary by Richard J Durling Barcelona: Publicacions i Edicions Universitat de Barcelona, 1985 (Seminarium historiae medicae cantabricense, Universidad de Santander) 393 pp. $30.00 (paperbound)

Louis Bakay. *An Early History of Craniotomy: From Antiquity to the Napoleonic Era* Springfield, Ill Charles C Thomas, 1985. xii + 168 pp Ill $22 75.

W. H. Brock *From Protyle to Proton. William Prout and the Nature of Matter, 1785–1985.* Bristol and Boston. Adam Hilger, 1985 xii + 252 pp $45 00 (Distributed in the U S by International Publishers Service, P O. Box 230, Accord, Massachusetts 02018).

William Hodson Brock (ed.). *Justus von Liebig und August Wilhelm Hofmann in ihren Briefen (1841–1873)* Weinheim, West Germany and Deerfield Beach, Florida Verlag Chemie, 1984 262 pp. DM72,00.

Paul C. Bucy (ed) *Neurosurgical Giants. Feet of Clay and Iron* New York-Amsterdam-Oxford: Elsevier, 1985. xvi + 459 pp Ill $65 00.

Antonio Carreras Panchon *Joaquín de Villalba (1752–1807) y los origenes de la historiografía medica española/Joaquín de Villalba (1752) and the Origins of Spanish Medical Historiography* English translation by David W Schofield Malaga, Spain· Universidad de Málaga, 1984 173 pp (paperbound). No price given.

Geoffrey Cocks *Psychotherapy in the Third Reich The Göring Institute* Oxford and New York: Oxford University Press, 1985. xii + 326 pp $24 95.

Roger Cooter *The Cultural Meaning of Popular Science. Phrenology and the Organization of Consent in Nineteenth-Century Britain.* Cambridge and New York Cambridge University Press, 1985. xiii + 418 pp $37 50

Hugh Cortazzi. *Dr Willis in Japan, 1862–1877 British Medical Pioneer* London and Dover, N.H . Athlone Press, 1985. x + 273 pp. Ill $29.50

M. Patricia Donahue *Nursing, The Finest Art An Illustrated History* St Louis-Princeton-Toronto: C V Mosby, 1985 xiv + 508 pp. Ill $44.95

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* The *Bulletin* reserves freedom of decision as to the publications to be included in this section Items received, other than those reviewed, are ultimately incorporated into the collection of the Institute of the History of Medicine

Bull Hist. Med, 1985, *59* 573–577

Elisabeth Finckh. *Foundations of Tibetan Medicine According to the Book "r Gyud Bzhi"* (vol. 2) London. Robinson Books, 1985. 131 pp. Ill £18 00.

Johannes Gessner *Johannes Gessners Pariser Tagebuch, 1727* Edited, with translation and commentary by Urs Boschung Bern-Stuttgart-Toronto. Verlag Hans Huber, 1985 (Studia Halleriana, no. 2). 420 pp. Ill Sw. Fr. 62,00; DM72,00.

Gerald N Grob (ed). *The Inner World of American Psychiatry, 1890–1940 Selected Correspondence.* New Brunswick, N J Rutgers University Press, 1985. xiv + 310 pp. $25.00.

Elizabeth Haigh *Xavier Bichat and the Medical Theory of the Eighteenth Century* London: Wellcome Institute for the History of Medicine, 1984 (Supplement to *Medical History,* no. 4). 146 pp. £11.00; $22 00 (Order from Science History Publications, Halfpenny Furze, Mill Lane, Chalfont St. Giles, Bucks. HP8 4NR, England)

Thomas L. Hankins *Science and the Enlightenment* Cambridge and New York. Cambridge University Press, 1985. viii + 216 pp $29.95.

Gladys L Hobby *Penicillin. Meeting the Challenge* New Haven and London. Yale University Press, 1985. xxii + 319 pp. Ill. $32.50

Kenneth F. Kiple *The Caribbean Slave. A Biological History* Cambridge and New York: Cambridge University Press, 1984. xiii + 274 pp. $32 50.

Charles D. Kochakian. *How It Was: Anabolic Action of Steroids and Remembrances* Birmingham: University of Alabama School of Medicine, 1984. xix + 116 pp. $10 95.

Antje Krug. *Heilkunst und Heilkult. Medizin in der Antike* Munich: C H. Beck, 1985 (Beck's Archäologische Bibliothek). 244 pp Ill. DM38,00.

John Tate Lanning. *The Royal Protomedicato. The Regulation of the Medical Profession in the Spanish Empire.* Edited by John Jay TePaske Durham, N C Duke University Press, 1985. 485 pp. $37.50

Coral Lansbury. *The Old Brown Dog: Women, Workers, and Vivisection in Edwardian England* Madison: University of Wisconsin Press, 1985. xi + 212 pp $23 50.

Ange-Pierre Leca *Et le choléra s'abattit sur Paris, 1832* Paris: Albin Michel, 1982 296 pp. F79,00 (paperbound)

William LeFanu (comp.) *A Bibliography of Edward Jenner* (2nd ed.). Winchester, Hampshire, England: St Paul's Bibliographies, 1985. xv + 160 pp £24.00, $36 00 (Distributed in the U S by the University Press of Virginia)

Georg Lilienthal. *Der "Lebensborn e.V." Ein Instrument nationalsozialistischer Rassenpolitik* Stuttgart and New York: Gustav Fischer, 1985 (Forschungen zur neueren Medizin- und Biologiegeschichte, vol. 1) vii + 264 pp DM48,00

Roderick E McGrew, with the collaboration of Margaret P. McGrew *Encyclopedia of Medical History* New York. McGraw-Hill Book Company, 1985 xiv + 400 pp $34.95.

Metascience Annual Review of the Australasian Association for the History, Philosophy and Social Studies of Science, vol 1–2, 1984. Kensington, N S.W.: Australasian Association for the History, Philosophy and Social Studies of Science, 1984 72 pp. Aust. $15.00 (paperbound).

Harriet S Meyer and George D Lundberg (eds) *Fifty-One Landmark Articles in Medicine. The JAMA Centennial Series* Chicago: American Medical Association, 1985 xiv + 486 pp. $15 95 (paperbound). (Please specify AMA-OP-217 when ordering)

G. G. Meynell (comp.) *The Two Sydenham Societies. A History and Bibliography of the Medical Classics Published by the Sydenham Society and the New Sydenham Society (1844–1911)*. Kent, England: Winterdown Books, 1985. viii + 192 pp. £13.00 (paperbound). (Order from Winterdown Books, Winterdown Farm, Acrise, Folkestone, Kent CT18 8LW, England)

James Monahan *Bear Ye One Another's Burdens: The Early Years of Rockford Memorial Hospital* Rockford, Ill.: Rockford Memorial Hospital, 1983. 52 pp Ill. $9.95 (paperbound).

John E. Murdoch *Album of Science Antiquity and the Middle Ages.* New York: Charles Scribner's Sons, 1984 (Albums of Science, vol. 3) xii + 403 pp Ill. $55.00

Derek J. Oddy and Derek S. Miller (eds) *Diet and Health in Modern Britain.* London and Dover, N.H.: Croom Helm, 1985. 326 pp £22 50.

Johannes Oehme. *Pädiatrie im 18. Jahrhundert.* Lübeck: Schmidt-Romhild/Hansische Verlagskontor Lübeck, 1984 (Documenta Pädiatrica, no. 12) 171 pp. Ill (paperbound). No price given.

Donald J Ortner and Walter G. J Putschar. *Identification of Pathological Conditions in Human Skeletal Remains* Washington, D.C.: Smithsonian Institution Press, 1985 (originally issued as *Smithsonian Contributions to Anthropology,* no 28, 1981) Ill. $29.95

John Pearn and Catherine O'Carrigan (eds.). *Australia's Quest for Colonial Health Some Influences on Early Health and Medicine in Australia* Brisbane, Australia: Department of Child Health, Royal Children's Hospital, 1983. xii + 304 pp $Aust.11.00 (paperbound) (Order c/o Mrs. Ellen Donovan, Department of Child Health, Royal Children's Hospital, Brisbane, Queensland 4029, Australia)

Giuseppe Penso *La médecine romaine: l'art d'Esculape dans la Rome antique* Paris: Les Editions Roger Dacosta, 1984 607 pp. Ill F500,00

Juan A. del Regato *Radiological Physicists* New York: American Institute of Physics for the American Association of Physicists in Medicine, 1985. 188 pp. Ill. $25.00.

Stanley Joel Reiser and Michael Anbar (eds.). *The Machine at the Bedside: Strategies for Using Technology in Patient Care* Cambridge and New York: Cambridge University Press, 1984. xviii + 363 pp. $49 50 (cloth); $14 95 (paperbound).

Pierre Ribon. *Guérisseurs et remèdes populaires dans la France ancienne* Le Coteau, France: Editions Horvath, 1983 169 pp F99,00 (paperbound).

Spencer L. Rogers. *Primitive Surgery. Skills Before Science.* Springfield, Ill.: Charles C Thomas, 1985. ix + 128 pp. $19 75.

Jean Sandrin *Enfants trouvés, enfants ouvriers XVII–XIX^e siècle.* Paris: Aubier Montaigne, 1982. 255 pp. Ill F50,00 (paperbound)

Catherine M Scholten. *Childbearing in American Society, 1650–1850* New York and London: New York University Press, 1985. viii + 143 pp. $22.50 (Distributed by Columbia University Press)

P H. Schrijvers (ed). *Eine Medizinische Erklärung der Männlichen Homosexualität aus der Antike* (Caelius Aurelianus *De morbis chronicis* IV 9) Amsterdam: B. R. Gruner Verlag, 1985 75 pp $12 00 (paperbound). (Available from John Benjamin Publishing, One Buttonwood Square, Philadelphia, Pennsylvania 19130)

James E. Shelley (comp.) *A Survey of Manuscript Sources for the History of Psychiatry and Related Areas in the Rockefeller Archive Center* North Tarrytown, N.Y.: Rockefeller Archive Center, 1985 107 pp (paperbound) No price given

H. A Snellen *History of Cardiology. A Brief Outline of the 350 Years' Prelude to an Explosive Growth.* Rotterdam: Donker Academic Publishers, 1984. 191 pp. Ill Dfl. 79,00

Jean Stengers and Anne Van Neck. *Histoire d'une grande peur. la masturbation* Brussels Editions de l'Universitaire de Bruxelles, 1984. 232 pp. B Fr 750,00 (paperbound).

John D. Stoeckle and George Abbott White. *Plain Pictures of Plain Doctoring: Vernacular Expression in New Deal Medicine and Photography.* Cambridge, Mass. MIT Press, 1985 (MIT Press Series on the Humanistic and Social Dimensions of Medicine, no 3). xxiii + 250 pp. Ill. $19.95.

Paul U. Unschuld. *Medicine in China A History of Ideas* Berkeley-Los Angeles-London University of California Press, 1985. xi + 423 pp. $40.00.

Gerlof Verwey. *Psychiatry in an Anthropological and Biomedical Context Philosophical Presuppositions and Implications of German Psychiatry, 1820–1870* Dordrecht-Boston-Lancaster: D Reidel, 1985 (Studies in the History of Modern Science, vol. 15). xix + 316 pp Dfl. 120,00; $44.50

Joaquín de Villalba *Epidemiologia española* (facsimile of 1803 edition). Malaga, Spain: Universidad de Málaga, 1984 348 pp. (paperbound) No price given

Morris J. Vogel *The Invention of the Modern Hospital· Boston, 1870–1930* (reprint of 1980 edition). Chicago and London. University of Chicago Press, 1985. 171 pp. $6 95 (paperbound)

Frederick B. Wagner, Jr. (ed) *The Twilight Years of Lady Osler· Letters of a Doctor's Wife.* Canton, Mass. Science History Publications U.S.A., 1985 xv + 144 pp. $20 00

Mary Warnock. *A Question of Life: The Warnock Report on Human Fertilisation & Embryology.* Oxford and New York: Basil Blackwell, 1985 xvii + 110 pp. $8.95 (paperbound)

A. Wear, R. K. French and I M. Lonie (eds.). *The Medical Renaissance of the Sixteenth Century* Cambridge and New York: Cambridge University Press, 1985. xvi + 349 pp $59 50.

Burghard Weiss. *Wie finde ich Literatur zur Geschichte der Naturwissenschaften und Technik* West Berlin· Berlin Verlag Arno Spitz, 1985 (Orientersungshilfen, vol. 27) 289 pp. DM36,00 (paperbound).

John Wilds *Ochsner's: An Informal History of the South's Largest Private Medical Center.* Baton Rouge and London. Louisiana State University Press, 1985. Ill. $22.50

CONTRIBUTORS TO THIS NUMBER

ROBERT BROWNING, Ph.D, is Emeritus Professor of Classics, University of London, and a Fellow of the British Academy and Dumbarton Oaks His research is principally concerned with Byzantine history and literature, with special reference to education and culture Among his books are *The Emperor Julian* (1976), *The Byzantine Empire* (1980) and *Medieval and Modern Greek* (2nd edition, 1983). His address is 17 Belsize Park Gardens, London NW3 4JG, England, U K.

GARY B. FERNGREN, Ph D, is Professor of History, Oregon State University, Corvallis, Oregon 97331. His research interests include the history of ancient medical ethics and the historical relationship of religion and medicine

THOMAS R. FORBES, Ph D., is E K. Hunt Professor Emeritus of Anatomy and Senior Research Fellow in the History of Medicine, Yale University School of Medicine, 333 Cedar Street, New Haven, Connecticut 06510. He recently edited Thomas Palmer's *The Admirable Secrets of Physick and Chyrurgery* (1984) His latest work, *Surgeons at the Bailey: English Forensic Medicine to 1878* will be published in 1986 by the Yale University Press

VICTORIA A. HARDEN, Ph D, historian for the National Institute of Allergy and Infectious Diseases, Building 5, Room 414, National Institutes of Health, Bethesda, Maryland 20892, is working on a history of Rocky Mountain spotted fever and the Institute's Rocky Mountain laboratory. The Johns Hopkins University Press will be publishing her book, *Inventing the NIH. A History of Federal Biomedical Research Policy, 1887–1937,* in 1986

DANIEL DE MOULIN, M.D, is Professor and Chairman of the Instituut voor Geschiedenis der Geneeskunde, Faculteit der Geneeskunde, Katholieke Universiteit Geert, Grooteplein Noord 9, Nijmegen, the Netherlands. He has written on a wide variety of medical history topics and his most recent book, *A Short History of Breast Cancer,* was published in 1983

JOHN SCARBOROUGH, Ph D, is professor of Historical Studies, School of Pharmacy, University of Wisconsin, Madison, Wisconsin 53706, and will become Director of the American Institute for the History of Pharmacy at the University in January 1986 He is editor of *Byzantine Medicine* (Washington, D.C · Dumbarton Oaks, 1985), and is currently finishing a monograph on Greek and Roman pharmacy and medical entomology.

JAMES HARVEY YOUNG, Ph.D, is Charles Howard Candler Professor of American Social History Emeritus at Emory University, Atlanta, Georgia 30322. He is the author of many books and articles relating to health quackery and drug regulation in the United States

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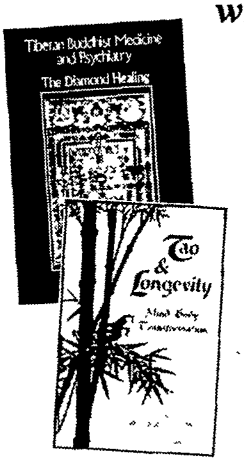

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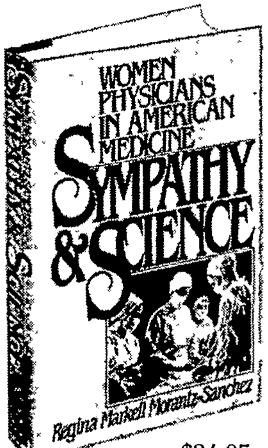
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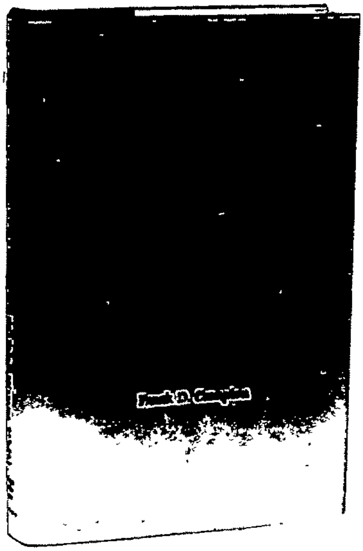

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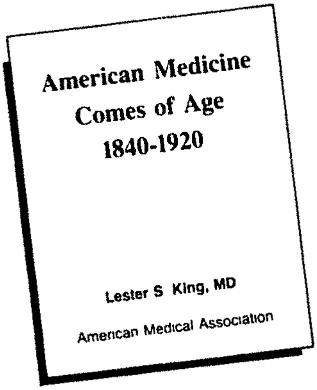

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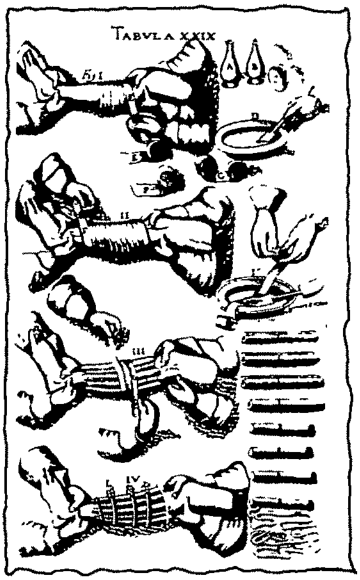

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